THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXXIV. No. 848.] LONDON, AUGUST 12, 1879. [31st Year.] Price 6d.

GAS PURIFICATION
BY
OXIDE OF IRON.

COOKE BROS.,
CENTRAL DEPÔTS:
CO. DONEGAL, IRELAND;
LONDON DEPÔT:
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OFFICES:
26, 27, & 28, FENCHURCH ST.,
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PAINT
Resists Sulphuretted Hydrogen. Does not Blister, Crack, or Flake off. Has very large surfacing powers.
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(Proprietors) STEVENS & CO.,
21, Great Winchester St., London, E.C.
Works: BRIXHAM, DEVON.

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103, ICKNIELD STREET EAST, BIRMINGHAM.
CONTRACTOR FOR
LAYING MAINS
FOR
Gas, Water, & Sanitary Purposes,
AND MANUFACTURER OF
WOOD GRIDS
FOR
SCRUBBERS AND PURIFIERS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL & CO.,
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Established at the commencement of Gas Lighting,
Manufacturers of
TUBES AND FITTINGS.
THREE PRIZE MEDALS,
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Head London Office:
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OLD PATENT TUBE-WORKS, WEDNESBURY.

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MANUFACTURERS OF
WET AND DRY GAS-METERS,
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PATENT COMPENSATING METERS,
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Established 1830.

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SPRING HILL, BIRMINGHAM,
MANUFACTURERS OF
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CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Ramps Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Offices: 97, CANNON STREET—
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THE
"OTTO" GAS-ENGINE.
See Advertisement in last week's JOURNAL, page 206.

CROSSLEY BROTHERS,
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NITSHILL COMPANY'S
DUKE OF HAMILTON'S
LESMAHAGOW
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AGENT:
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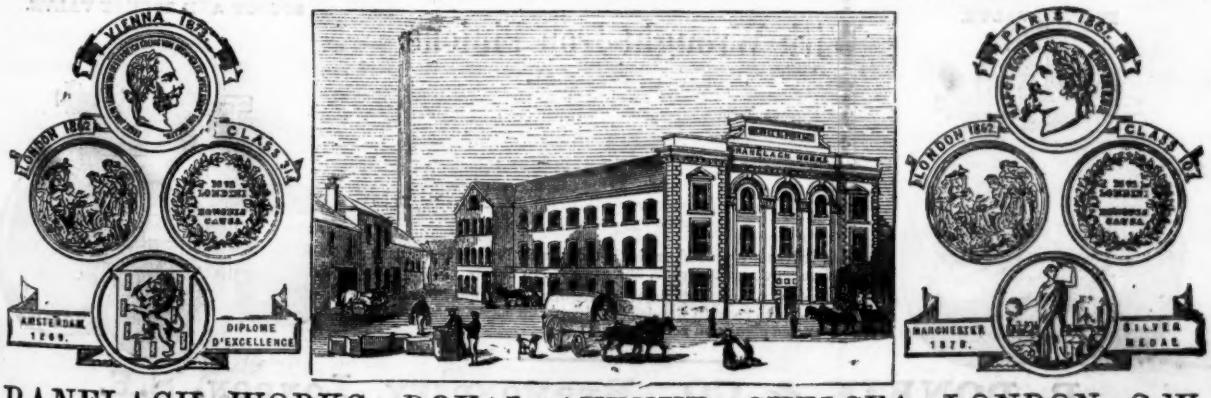
CHANGE OF ADDRESS.

GEORGE GLOVER AND CO.,
DRY GAS-METER MANUFACTURERS,
HAVE REMOVED TO MORE EXTENSIVE PREMISES:



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Manufacturers of W. J. WARNER'S PATENT MARKET GAS STAND-PIPE.

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Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

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SOLE MANUFACTURERS OF THE

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Largely used by Gas Companies, Corporations, Railway Companies, Ironfounders, and Machinists. It has the following qualifications and properties:—

EFFECTUALLY PREVENTS AND ARRESTS CORROSION.
HAS A FINE GLOSS, AND IS VERY DURABLE.
DOES NOT REQUIRE DRIERS LIKE OTHER PAINTS.
PROTECTS IRON FROM ACTION OF WATER.

IS NOT AFFECTED BY SULPHURETTED HYDROGEN.
FORMS A VERY HARD TOUGH (NOT BRITTLE) SURFACE.
WILL NOT CRACK, BLISTER, OR SCALE
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COVERS NEARLY DOUBLE THE AREA OF OTHER PAINTS.
(7 gallons or 1 cwt. will cover 1211 square yards of Ironwork.)
IS CHEAPER AND MORE ECONOMICAL THAN ANY OTHER.

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IMPROVED CONSUMERS WET GAS-METERS

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THE UNVARYING WATER-LINE GAS-METER,

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STATION-METERS OF ALL SIZES, with PLANED JOINTS;

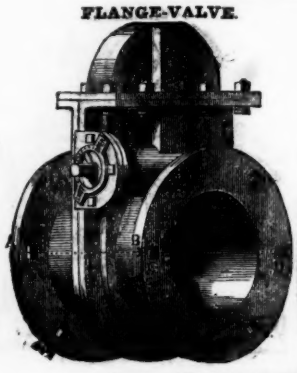
GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS.

And all kinds of Experimental Gas Apparatus.

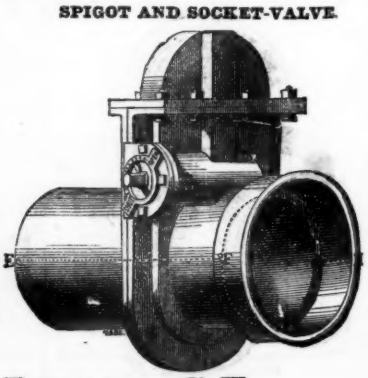
IMPROVED GAS-VALVES

With Wrought-Iron Pinions.

FLANGE-VALVE.



SPIGOT AND SOCKET-VALVE.



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List of Prices, with dimensions of all Sizes up to 48 inches, to be had on application.

These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.

In ordering, please state whether required for under or above ground, and if to be with flanges or spigots and sockets cast on, or with separate spigot and socket-pieces.

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Also Makers of Steam-Engines, Beale's Exhausters, Water-Valves, &c.

HYDRATED PURIFYING MATERIAL.

Samples on application.

MESSRS. SPENCE BROS., LIMITED,

Will be glad to supply the above on the most favourable terms, and to treat, by Purchase or Exchange, for Spent Oxide.

PRICES ON APPLICATION.

ALSO PATENT DRY COPPERAS FOR EXTRACTING AMMONIA.

VICTORIA CHEMICAL WORKS, BRADFORD, NEAR MANCHESTER.

IMPROVED HYDRAULIC CRANES,

Effecting a great saving in the cost of discharging Coals from Vessels, Barges, &c. Several of these Cranes, with the necessary power, are now being erected at Beckton, Hull, and other Gas-Works.

HYDRAULIC APPARATUS for Lifting and Lowering Purifier-Covers.

Sixteen recently erected at Beckton, applied to Covers 30 feet square.

SULPHATE OF AMMONIA APPARATUS,

IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY, AND IN COURSE OF ERECTION AT THE CARLISLE CORPORATION GAS-WORKS.

Special "REGULUS COCKS" manufactured to stand Acid.

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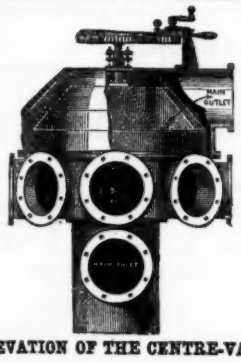
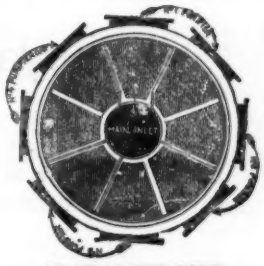
2, SUFFOLK LANE, CANNON STREET, E.C., or PARK WORKS, GATESHEAD-ON-TYNE.

C. & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.

PLAN OF THE VALVE.



PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

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GAS PURIFICATION & CHEMICAL Co., LIMITED,
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IMPROVED CENTRE-VALVES,
PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

WEST'S GAS IMPROVEMENT COMPANY,
LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,
And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

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A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

APPARATUS CONNECTED WITH GAS-WORKS.
THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES
FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

MANUFACTURERS ALSO OF SUPERIOR WOOD GRIDS FOR PURIFIERS, SCRUBBERS, &c.

C. & W. WALKER'S
WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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SWANWICK CANNEL.

Illuminating power, 24 candles. Good Coke, 11¼ cwt. to the ton.
For analysis, prices, and references, apply to
H. BOAM, Litchurch Villa, DERBY.

ESTABLISHED IN 1830.

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THE ORIGINAL MANUFACTURER OF THE IMPROVED
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FOR
GAS PURIFIERS & SCRUBBERS.

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The Dunston Engine Works Co.,

GATESHEAD-UPON-TYNE.
Are the Sole Manufacturers of
Archer's Patent Hoists,
ALSO OF
Archer's Patent Stone Breaker,
AND OF
Archer's Patent Ore Crusher & Pulveriser,
The last-named Machine (without the Pulveriser) makes the best and most durable Coke Breaker.

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153, CLEVELAND STREET,
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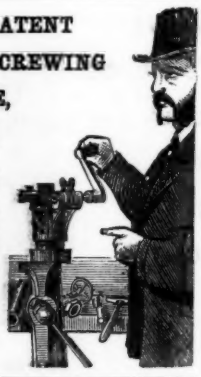
It requires but one trial to prove the Superior Make, Strength, and Durability of these Sieves.

CARRIAGE PAID.

GRIRDROD'S PATENT
PORTABLE PIPE SCREWING MACHINE,



For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.
In use at the chief gas-works, and giving great satisfaction.
For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,
Brassfounders, Gauge Injector and Tool Makers,
ALBION WORKS, SALFORD,
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Gold Medal Awarded, Paris Exhibition, 1878.

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SHEAF AND SPRING WORKS,
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MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS,
STEEL OF ALL DESCRIPTIONS,
SCREW STOCKS, TAPS, AND DIES, SPANNERS, RATCHET BRACES, LIFTING-JACKS, ANVILS, VICES,
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MANUFACTURERS OF
WET AND DRY GAS-METERS.
STATION-METERS, GOVERNORS,
PRESSURE AND EXHAUST REGISTERS,
LAMP-METERS IN CAST-IRON BOXES,
And every Description of Gas Apparatus.

JAMES MILNE & SON,
GAS ENGINEERS,
Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,
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2, KING EDWARD STREET,
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Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,
And every description of Gas-Fittings and Gas Apparatus.

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For Prices and Particulars, apply to
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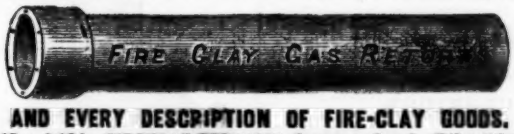
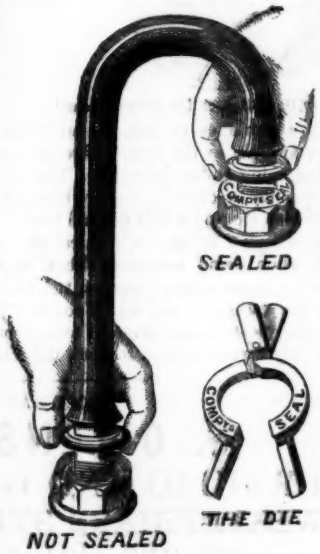
JOHN HALL AND CO., STOURBRIDGE,
Manufacturers of FIRE-BRICKS, LUMPS, TILES,



AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.
N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

FOULGER'S PATENT
COUNTER-SUNK SEAL GAS-METER UNIONS,
As Supplied to The Gaslight and Coke Company.



These Unions practically place a Gas Company's property under lock and key, by rendering it impossible to disconnect at any joint at which gas could be obtained unregistered, without destroying the Company's seal or signature, whilst a small cover absolutely protects the impression from accidental injury.

A meter having been fixed with one of these Unions on the main-cock, and another on the inlet, a few pinches of specially prepared crushed sealing-wax is placed in the cup, and being melted with a blow-pipe, the wax runs between the reversed threads, the circular tong-shaped die will then give a sharp impression of the Gas Company's title, an operation requiring about two minutes in all to perform.

If heat is applied for the purpose of unsoldering the joints, the wax is instantly fused, and the impression, of course, lost.

Are supplied in all sizes, either as Caps and Linings or Barrel-Unions, and at a small additional cost over existing connections.

For further Particulars, Samples, &c., apply to the Sole Agents,

WIGGINS & RIHLL,
VICTORIA DOCK ROAD, LONDON, E.

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CONSULTING GAS ENGINEER
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Established 1799.
ROBERTSONS & CO.,
TWEED IRON-WORKS,
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Makers of Socket, Flange, and Hot-Water Pipes, Tank-Plates, Lamp-Posts, Columns, Girders, and Gas and other Castings.

THOMAS CARR & SON,
MANUFACTURERS OF
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COTSWOOD FIRE-BRICK WORKS, SCOTSWOOD-ON-TYNE.
Also Makers of all kinds of Common Building Bricks, and of Pressed White and Red Bricks for Facing.

BIRTLEY IRON WORKS,
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DURHAM.
Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
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JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
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WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,
Manufacture and keep in stock at their works (also a large stock in London) PIPES and CONNECTIONS 1½ to 48 inches in diameter; and make to order Retorts, Purifiers, and Tanks, with or without planed joints, Columns, Girders, Special Castings, required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
NOTE.—Syphons and Covers are joint-faced if required, doing away with millboard and iron boring, or Syphons made without Covers, a socket being cast on and fitted with a small plug about 6 inches in diameter with lead joint. In either way preventing leakage.

THE
SILICA FIRE-BRICK CO.,
OUGHTIBRIDGE
Near SHEFFIELD,
Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE
FIRE CLAY & BRICK WORKS,
STOURBRIDGE.
Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Successors to
E. BAKER AND CO., LATE BRIERLEY HILL, STAFFORDSHIRE.

HARPER & MOORES,
PROPRIETORS OF THE
BEST STOURBRIDGE CLAYS,
STOURBRIDGE.
Manufacturers of all Descriptions of
BEST STOURBRIDGE FIRE-BRICKS, LUMPS AND CLAY RETORTS
Of all Dimensions for Gas-Works,
GLASS-HOUSE POTS & CRUCIBLES
ESTABLISHED 1836.
The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture. SILVER MEDAL, PARIS, 1878.

GAS AND WATER PIPES.
WILLIAM MACLEOD & CO.,
30, ST. ENOCH SQUARE, GLASGOW.

CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B., GLASGOW.
Prices on application.

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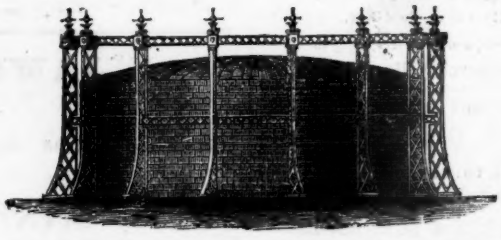
MANUFACTORY AND SHOW-ROOMS:
BROAD STREET, BIRMINGHAM.
ESTABLISHED 1807.
MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,
WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.
TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,
LIMITED,
TIPTON, STAFFORDSHIRE.
LONDON OFFICE:
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GAS ENGINEERS, IRONFOUNDERS, &c.,
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GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,
AND ALL REQUISITES FOR EITHER
GAS OR WATER WORKS;
ALSO
MAKERS OF ROOFS, BRIDGES, &c.

MANN & OWENS' PATENT GAS-VALVE.

EVERY VALVE
WARRANTED TO BE
PERFECTLY
SOUND
AND
GAS-TIGHT.

VALVE, with Indicator for Above Ground. UNDERGROUND VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:
S. OWENS AND CO.,
HYDRAULIC AND GENERAL ENGINEERS,
WHITEFRIARS STREET, LONDON, E.C.
PRICES, SIZES, AND FULL PARTICULARS ON APPLICATION.

TANGYE BROTHERS AND HOLMAN,

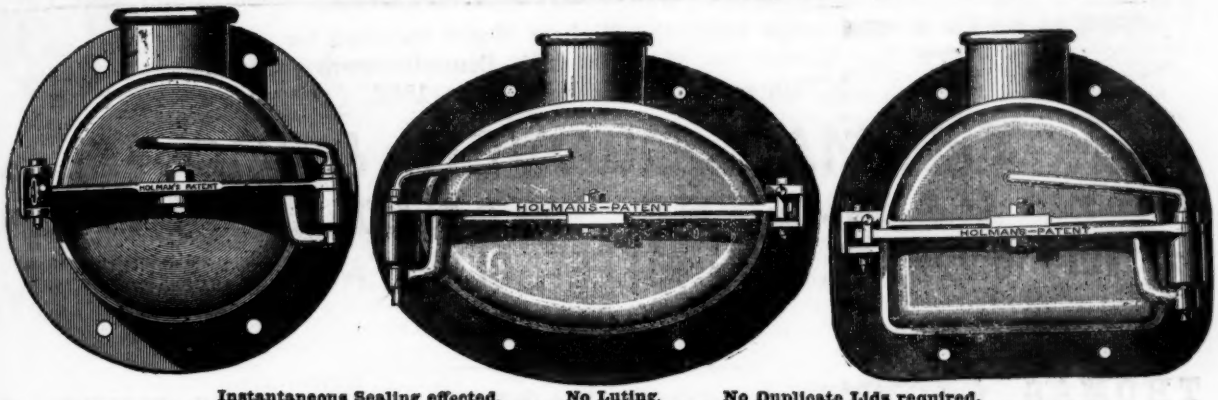
CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

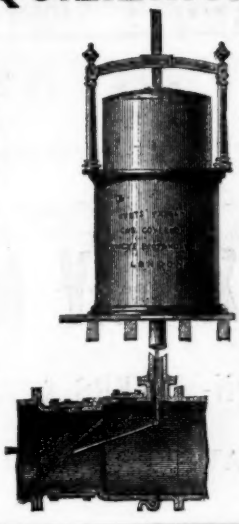
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (2), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1878.

MESSRS. TANGYE BROTHERS AND HOLMAN.

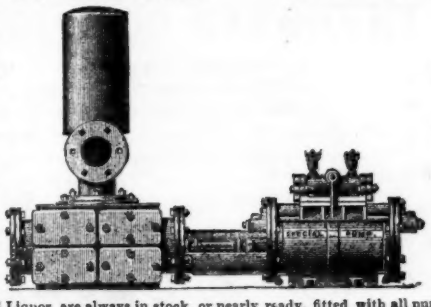
Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,
(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	21
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have over FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HIGH-PRESSURE AND CONDENSING STEAM-ENGINES; CORNISH, VERTICAL, & TUBULAR BOILERS; HYDRAULIC AND SCREW LIFTING-JACKS, CRABS, PULLEY-BLOCKS, &c.

FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851. New York. 1853. Paris, 1855. London. 1862.

Dublin, 1865. Paris, 1867.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters bv the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

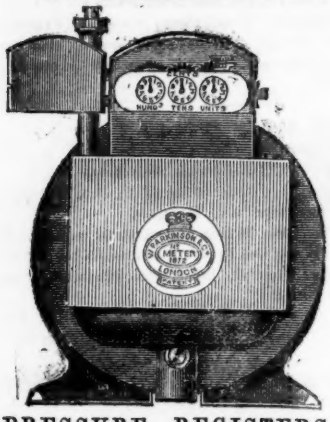
214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS.

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.,



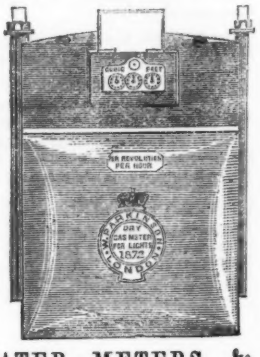
(ESTABLISHED 1816,)

MANUFACTURERS OF

WET & DRY METERS,

STATION-METERS & GOVERNORS,

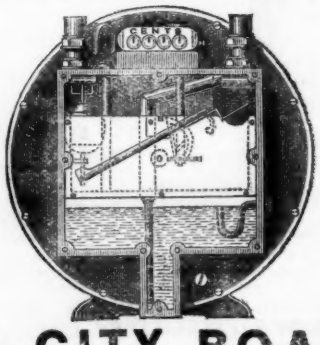
EXHAUSTER REGULATORS,



PRESSURE REGISTERS, EXPERIMENTAL APPARATUS, GAUGES, WATER-METERS, &c.

HUNT'S PATENT IMPROVED COMPENSATING METER.

In this Meter, the action of the measuring-drum is reversed. By this arrangement an improvement is effected in the registration at high speeds, which, in many tests, has not varied from the smallest light to three times the capacity of the meter. It works equally well under all pressures. The range of error between the high and low line is much smaller than that allowed by the "Sale of Gas Act."



The Meter has been critically tested, and most favourably reported upon by official Meter Inspectors in London and Birmingham.

W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, AUGUST 12, 1879.

Circular to Gas Companies.

We have no wish to suppress one atom of information which relates to the extension of the use of the electric light. The Metropolitan Board of Works, having resolved to give the light a more extended trial on the Thames Embankment and Waterloo Bridge, but having failed to obtain the sanction of the Vestry of St. Martin's-in-the-Fields to use the light in Northumberland Avenue, have cast about for some other spot on which to expend their surplus power. Under the inspiration of their Engineer and Chemist, they have determined to illuminate their board-room by electricity, and also to place one large light over the entry in Spring Gardens. The hall is to be lighted by four lamps placed upon standards. The light over the doorway in Spring Gardens will have a manifest advantage, for a strong light has been wanted there for years. The narrow issue out of St. James's Park decidedly needs illumination, and the Metropolitan Board will be doing good work if they can effectually light up this thoroughfare. With regard to the internal illumination, we shall, of course, watch the results with much interest. It can hardly be considered a conclusive experiment, as the Board only sit for a few hours at a time; so that, as far as the lighting up of interiors is concerned, but a limited conclusion can be drawn. However, it will doubtless answer, and much will, of course, be made of the satisfactory result.

A larger experiment in electric lighting is about to be made by the Corporation of Blackpool, who, in the course of September next, intend to convert night into day on their long promenade, by the use of six naked lights, having the illuminating power of about 6000 candles, and fixed at a height of fifty feet above the pavement. This is, in some respects, a novel experiment; but it is one which should be made. Blackpool will not be converted into a summer residence all the year round, however well the electric light may succeed. Lancashire people go to bed early, and any amount of illumination on the promenade will only induce a few to remain thereon. Hardly a word need be said about the extension of the light on board ironclads, and for the illumination of harbours. A more extended application of the light is being made in this direction, which will probably be followed up by others. In this application we see the most legitimate use of the electric light, and shall be happy to congratulate the Admiralty and all concerned on its successful employment. In all this there is nothing to alarm gas producers or shareholders. We watch the development of the electric light with perfect equanimity, certain that there is not in its use anything inimical to the interests of gas proprietors.

We believe we are right in asserting that the amalgamation between the South Metropolitan and Surrey Consumers Gas Companies will be sanctioned this week. Difficulties arose, but have now, we believe, been settled, and we understand that the Board of Trade will, in the course of a few days—subject to the approval of Her Majesty in Council—sanction the arrangement which has been come to between the Companies, with some alterations of no great importance which have been made since we published the scheme.

It is now fully understood that the Phœnix Company do not propose, for the present, to enter into the arrangement, intending to go to Parliament next year for, among other things, power to amalgamate with any Company whom they can persuade to unite with them. It is difficult to say in what direction they can be looking for allies. So far as can be seen, the South Metropolitan and the Surrey Consumers Companies are now closed against them. The London Company would appear to have nothing to say to any combination. In hardly any case could they fall in with the Phœnix, unless their district were divided, and the best part of it went to the Chartered across the water. It is very much to be regretted that a southern combination has not been effected; but the union which will, we hope, be sanctioned in the course of the present week, must tell greatly to the advantage of the consumers within the Surrey Company's limits. It is something to have an immediate reduction of sevenpence per thousand feet, with a prospective diminution of twopence per thousand feet more within a short period. We shall not stop here to inquire whence the profits are to come which in time will justify this reduction, and maintain the dividends at the rates proposed. It is quite clear that they cannot be derived at present from the working of the Surrey Consumers Company, and hence some uproar on the part of consumers in the district of the South Metropolitan, who imagine that the price of gas within their limits must be kept up to provide a dividend for the Surrey Consumers Company. There is perhaps a substratum of truth in this supposition, but it must be remembered that in practical life we have all to make sacrifices, sometimes large and sometimes small. The consumers in one district may not get all the advantage they might hope to derive from the independent existence of the South Metropolitan Company, but they have at the same time the satisfaction of knowing that in the course of a year or two, after aiding their neighbours to obtain the benefits of cheaper gas, they will themselves participate in advantages which could only be derived from amalgamation. It is in the highest degree essential that the two Companies to which we now allude should unite. The one, as we have said before, has exactly what the other requires, and their combination can only tend to enhance the benefits to the Shareholders and Consumers of each.

The report of the Directors of The Gaslight and Coke Company, and the accounts for the past half year, have been issued in anticipation of the half-yearly meeting to be held next Friday. It is unnecessary to say that the working results have been eminently satisfactory. From the sale of gas the Company received no less than £1,024,758, against which may be placed a cost for coals of £474,224. Meter-rents produced £18,116, and residuals £225,946. The balance of revenue account shows a profit of £383,065, which, after providing for all preferential charges, leaves a balance applicable to dividend on ordinary shares of £327,210. The amount required for the payment of the dividend for the previous half year was £225,597, which leaves £101,613 to be appropriated to the reserve and other funds, and to be carried forward. This result is certainly not quite so good as that obtained in the previous half year, but the difference is small.

We have spoken of the dividends; those for the past half year amounted to 10½ per cent. on the ordinary stock, and

the same amount is proposed this half. The prosperity of the Company seems in every respect assured. There appears to be but one drawback, and that is a difficulty in disposing of coke. Of course, the enormous production at Beckton must, for a time, present some obstacles to the profitable distribution of this important residual; but as years go on we are satisfied that a free market will be found for all that the Company can produce. We note with much satisfaction a passage in the report which mentions that, as regards other residual products, the distillation and manufacture of which at the new works at Beckton was commenced in the month of June, the experience already obtained is sufficient to lead the Directors to believe that this new branch of their undertaking will prove a remunerative one. We were among the first to urge upon the Directors the advisability of working up their own residuals, and we are much gratified in finding that, so far as their knowledge has hitherto gone, they have done so with a profit. As regards coke, we have repeatedly pressed upon their attention the fact that artificial fuel, from which the Paris Gas Company make such considerable profits, might be produced at Beckton, at which place there would probably be a large sale for it. Breeze is a commodity which a Company circumstanced like the Chartered should not have on hand. Coke they may, at times, be overburdened with; but if this be pounded, and made into a mass with pitch, and moulded into proper forms, we feel satisfied that an enormous sale might be procured in the Thames. As regards working details, we note with satisfaction that the production of gas per ton of coal has been well kept up. The amount of coal and cannel carbonized during the half year was 604,297 tons, from each of which, on the average, 10,116 cubic feet of gas were obtained. The quantity sold per ton appears to have been 9485 feet, leaving for consumption on the works and unaccounted for 631 feet per ton. These results are exceedingly good, and a credit to the Engineers and all concerned in the management.

The results of the sale of the Company's new stock have already been laid before our readers, who will remember that the reserve price was £175, at which price all the stock not sold by auction has been taken up by the Shareholders. The Company have every reason to congratulate themselves upon this, their first sale by auction. The premiums realized amounted to £75,240, and will be applied to extending or improving the works, and will not be entitled to dividend. Debenture stock is now to be issued to redeem expiring mortgages, and for further additions to mains, &c., in order to meet the continually increasing demands for gas.

The gas accounts of the Corporation of Nottingham, which were to be presented at a meeting of the Town Council yesterday, exhibit no particular feature, except one which it is always a pleasure to us to notice. It has ever been our contention that Corporations should make no profit by the sale of gas, and we are, therefore, pleased to find that the Gas Committee recommend another reduction in price. For the past year the gross profit of the undertaking was £43,423, the net profit having been £14,957, and the Gas Committee, after having made proper additions to the reserve-fund, have a balance in hand which allows them once more to recommend a reduction of twopence per thousand feet. The charge will then, we rather think, be 2s. 8d. within the borough—the lowest price at which gas has ever been supplied in Nottingham. The report of the Gas Committee states that this will be the fourth reduction made since the works came into the hands of the Corporation in 1874. We must once again express our satisfaction with the clearness of the accounts which the Corporation render. We miss, however, one account which the General Manager, Mr. Wilson, could supply—namely, the details of working. We are told, for example, that 97,713 tons of coal and cannel were carbonized, but it is not stated how much gas per ton was produced from this. We know, however, that the appointments of all the Nottingham works are so good, that we feel satisfied that if the details were supplied the working results would be shown to be equal to any in the kingdom.

[We have since learned that, at the meeting of the Town Council yesterday, the Gas Committee's report was adopted, except the part referring to the reduction in the price of gas. The price will not, therefore, be reduced as proposed.]

We may equally congratulate the Gas Committee of the Salford Corporation on the results of their year's working, and, further, on the admirably clear statement of accounts which they now present. It is only fair to say that the improved form of accounts now adopted by the Gas Committee is, we believe, due to the suggestions of Mr. Hunter, the Engineer of the undertaking. It appears that in the course of the past year the Corporation made a gross profit of £44,573, and, after paying £11,887 for interest, £2530 as annuities, and appropriating £20,154 to the reserve and other funds, they have £10,000 left for improvement purposes—a sum which has been distributed in the way we have already announced. In working details, we miss the amount of coal carbonized. The quantity of gas manufactured was 10·02 per cent. more than in the previous year. The loss by leakage—or, rather, unaccounted-for gas—was 13·97 per cent. This is high; but we believe the distributing apparatus of the Corporation was, at no distant date, in a rather dilapidated condition; it is now, however, being brought into order, and the leakage gradually reduced. It should have been mentioned above that the price of gas in Salford is being rapidly brought down, and it is noteworthy that the capital account of the undertaking is being lowered, notwithstanding the fact that large extensions are now in progress. We may turn for a moment to the quality of the gas, especially as some discussion respecting it occurred at the Council meeting. That twenty-candle gas blackens ceilings is not to be wondered at. Mr. Hunter is perfectly right when he says that gas of this quality will not emit soot when it is properly consumed, but at the same time he must remember that, in all probability, the majority of consumers in the borough have bad burners, which simply waste the gas and disfigure their habitations. Mr. Hunter's next efforts should be directed towards persuading the consumers of Salford into using the burners best adapted for the consumption of the quality of the gas which he supplies.

In another column will be found the gas accounts of the Corporation of Belfast. In presenting these accounts and those which have preceded them, we may make a candid confession. The profits of the three Corporations which are noticed to-day, it must be admitted, are highly tempting. They show the large profits which gas undertakings will produce, and how much, under what we call improper management, may be applied in relief of rates. This fact is certain to increase the cupidity of Corporations, and induce them to attempt the absorption—we cannot in these cases say the confiscation of Gas Companies. Of Salford we need not speak, for the Local Authorities there obtained the gas-works almost contemporaneously with the invention of gas lighting. Nottingham and Belfast purchased their undertakings of Companies, and, we are bound to say, paid fair prices for them. Still, as their accounts show, they make good profits. This is nothing to their credit, for Gas Companies would have supplied equally good gas at charges as low, and the profits they made would no doubt have been expended to the general advantage of the community. In the particular case now under notice—viz., Belfast—we find that the gross profit made last year was £47,264, and the net profit on the year's working is £27,316, which, after the appropriation of several sums, appears to leave a balance of £22,926. The proposed disposal of this balance is somewhat remarkable. It was suggested by Sir John Savage, the Chairman of the Gas Committee of the Corporation, that at least £10,000 of the balance should be applied to sewerage and drainage purposes. Belfast, no doubt, requires drains and sewers; but the most inappropriate use to which gas profits could be put is, in our opinion, the relief of rates in this direction. The provision of drainage and sewerage works, under our present municipal system, is so peculiarly a duty of the landlord, that we are astonished that a man so eminent in municipal matters as Sir John Savage should suggest such an appropriation. To carry out the plan would, we say with all respect, be to most unduly tax the gas consumers. Let us for a moment go back to the Gas-Works Clauses Act of 1847. This enactment is a distinct enunciation of the principle upon which gas profits should be divided. Ten per cent. is to be allotted to Shareholders, but any overplus of profit is to be applied in reduction of price. When we come to corporate undertakings, it must be understood that there are no Shareholders. The profits, in strict legality, can only be applied to the discharge of pecuniary liabilities which have been incurred in conducting the undertaking. The rest obviously belongs to the consumers, *quoad* consumers, and not to the ratepayers, who may be regarded as the proprietors of the undertaking. The principle of this Act fairly applied to Corporation gas undertakings would leave little to be desired in their financial management. Out of the gross profits should come a sufficient sum to pay all charges with relation to interest, depreciation, and sinking, &c., funds. The remainder belongs to the consumer, and should be applied in reduction of price. Still, as we have often said, the Scotch system is simpler and better. A gas undertaking in the hands of a local authority ought to be merely self-supporting.

But to return to Belfast. We notice with much regret that Sir John Savage, who was the principal agent in effecting the purchase of the Gas Companies, is about to retire from the post which he has so successfully filled. His loss to the office will be severely felt, but there appears to be a possibility that he may still exercise some influence over the gas concerns of the Corporation. Sir John Savage would seem to be somewhat scared at the prospect that the electric light may presently supersede coal gas, and entirely abolish the profits of gas manufacturers, and, consequently, make the capital engaged in Corporation undertakings worthless. We may assure the worthy knight that in our opinion gas will long outlive this generation.

A few words will dispose of the meeting of the York United Gaslight Company. They pay maximum dividends, and have a balance to carry forward. The condition of this Company and their operations prove that as good—probably better results to consumers can be obtained by the operations of Companies than by Corporations. The price of gas in York is, quality being considered, almost the lowest in the kingdom, and being compared with Corporation supplies under similar conditions and not far distant, it is clearly shown that Companies can do all that a Corporation is expected to perform, and even more.

We are sorry that space will not admit this week of a notice of the remainder of the papers read at the meeting of the North British Association of Gas Managers. These, some of which are of much importance, will receive further attention hereafter. The paper by Mr. Young, of Clippens, which appeared in our last number, is of great importance, and cannot be disposed of in a few sentences. Carbon is, of course, the material which furnishes light on combustion, where, at all events, gas is concerned; but to produce the maximum amount of light, carbon must be present in particular conditions. It is the duty of gas managers to search out means of producing the amount of carbon in such a state of condensation as will furnish the maximum amount of light. To this point Mr. Young and his friends should devote their earnest attention.

GRANTHAM GAS COMPANY.—The half-yearly meeting of this Company was held last Thursday—Mr. Burbidge presiding. The report of the Directors was as follows:—"It is a great gratification to your Directors to be able to report a favourable issue to their programme of July 30, 1878, notwithstanding the reduction of 5d. per 1000 feet in the price of gas, as then announced. They are happy to state that the increased consumption of gas has enabled them to offer to their Proprietors the usual dividend of 10 per cent. on the original capital of £25,000, together with a return of 8 per cent. on back dividends, which will close that account; also a dividend of 7 per cent. for the half year upon the £5000 new capital. The Company's works are in a most efficient condition, which is entirely attributable to the management of their Manager, Mr. Barratt. Your Directors have further pleasure in being able to propose another reduction of 5d. per 1000 in the price of gas, to commence from the 1st of July last, thus reducing it to 3s. 4d. per 1000 feet, being the lowest price at which it has ever been produced at Grantham." The statement of accounts from January 1 to June 30, 1879, showed that the capital of the Company consists of 1250 original shares of £10 each, and 250 new shares of £20 each; while the amount expended on capital account is £28,875 9s. 2d. There was a balance of £3951 11s. 4d. on revenue account; coal and carriage costing £1808 1s. 3d., and gas-rental bringing in £3231 1s. 6d. The Company have a reserve-fund of £2500. The Chairman thought the Shareholders could not do otherwise than consider the report very satisfactory, as he assured them the Directors considered it. Notwithstanding that they had reduced the price of gas three times within the last three years, and now a fourth time, they were enabled to pay their usual dividend of 10 per cent., and at the same time to make up for a little "back-reckoning," as he might call it, a few years ago. They allowed 8 per cent. for back dividends, which would close that account. They were also enabled to pay the dividend on the new shares of 7 per cent. for the half year. In the report, the works were pronounced to be in good condition; and he was not aware that there was any great expenditure required upon them now. The report went on to say that this efficiency was attributable to their Manager, Mr. Barratt, and he should like to back up that remark by saying that it was not a mere compliment. The efficiency of the works was entirely due to the Manager. Himself and brother Directors did not take any share of that efficiency on their own shoulders. They helped their Manager, as far as they could, in improving anything which required to be done, and he was not aware that they had said nay to anything, because they did not think he had asked for anything that was unnecessary. The last paragraph of the report referred to the reduction in the price of gas, from this time, of another 5d. per 1000 feet. They were now having gas at the lowest rate at which it had ever been supplied in Grantham. There were not many towns in which it was lower, but if there were any it was because they were better situated for obtaining coals on more favourable terms. Mr. Johnston inquired if there were any towns in which a lower rate was charged. Mr. Barratt said there were—some manufacturing towns, for instance—but they paid much less for coals. The Chairman added that the quality of the gas was not so good in these places as at Grantham. He moved that the report be received and adopted, which was seconded by Mr. B. C. Ogden, and carried. The dividends mentioned in the report were accepted, on the motion of the Chairman, seconded by Mr. Johnston, who remarked that the account presented to them was most satisfactory, and he thought they were much indebted to their Manager for what he had done in reference to it. The Chairman doubted whether they would be able to make another reduction of 5d., but he hoped they might. He saw that the price of coals was advancing. Mr. Johnston then proposed a vote of thanks to the Chairman for his very efficient services on behalf of the Company, which was acknowledged, and the proceedings ended.

Water and Sanitary Notes.

THE meeting of working men, held at Exeter Hall last Wednesday evening, which was intended to persuade the Government to take up the question of water supply to the Metropolis, was unquestionably, in its way, a success. The great hall was about half filled, and the working-man element was distinctly prominent. We are bound to say this, for there are so many "shams" in these days, that we are happy to record one genuine meeting. The assembly was distinctly enthusiastic, the teetotal element being probably predominant. These innocent people imagine that a new supply of water to London would be an instantaneous cure for intoxication. We shall not attempt to interfere with their principles or prejudices. We know perfectly well that the water supplied to the Metropolis is universally of excellent quality, and if the supply runs short in a particular district, the causes are apparent, and for a time irremediable. So much seemed to be admitted by all the speakers at Exeter Hall on Wednesday evening. They know perfectly well that the supply is ample, and the cost, after all, not extravagant. A resolution was proposed by Sir Charles Dilke, as follows:—"That "the present water supply of London is unsatisfactory, both "in the quality of the water and the cost." Neither assertion was supported by any evidence worth mentioning. The quality of the water supplied to the Metropolis is excellent; as regards the cost, it might, of course, be cheaper if it were supplied without profit. Dr. Lyon Playfair is of opinion that the evils alleged cannot be remedied except by creating a new authority and administration by Act of Parliament. Dr. Playfair was once a rather popular lecturer on chemical science, and addressing such an audience as listened to him on Wednesday evening, he was bound to indulge in the kind of talk with which scientific lecturers entertain their hearers. We do not report the speeches, for, as a matter of fact, they possess but very small intrinsic interest. We note this with great satisfaction, that no idea of confiscation appeared to be entertained by any of the speakers. It was admitted on all hands that the Metropolitan Water Companies must be bought up at a fair price. What this price is supposed to be was only suggested by one speaker—Mr. Bateman, C.E.—who estimated that the present value of the Metropolitan Water Companies was nineteen millions sterling. Mr. Bateman probably knows that the interests of the Companies could by no possibility be obtained at this price. Our own value of twenty-three millions will, we think, be found much nearer the mark, and at this price we have little doubt the Companies might be bought up.

The next question that was suggested by Mr. Bateman in his speech—admirable, we may say—was the quality of the water supplied to the Metropolis. The speaker has, of course, his preference for a soft water; but we were glad to find that he did not indulge in any extravagant schemes. He seems disposed to take the Metropolitan Water Supply as it is, and make the best of it. The present arrangements, he mentions, may be so altered as to afford a constant supply at a reasonably high pressure, and this is a very important consideration. Softness may be ensured at no great cost, but Mr. Bateman knows that the inhabitants of the Metropolis prefer a moderately hard water, and he further knows that the substitution of a soft for a hard supply would probably result in much evil. It is very well to assert that an enormous saving would result in the consumption of soap, if a soft water supply were instituted; but we look at this as purely problematical. We must not pass over our friend Mr. Watherston, who, in the place of making a speech, read the resolutions which had been arrived at by the Vestry Delegates at the conferences at St. Martin's-in-the-Fields. He also repeated the reiterated assertion that there is somewhere in existence a plan which shows clearly that the Metropolitan Water Undertakings may be purchased, for the advantage of the public, at no cost whatever. Of course, every one knows what it is, but the sooner it is made public the better. Mr. Firth made an excellent and temperate speech. What they seem to require is, first, uniformity of management, which would result in economy—not to the extent to which the speakers suppose—and a reduction in cost which would ensue from some alteration in the system of rating. It is to this extent, so far as we can see, that the demands of the working men go, and it will be found that their ideas agree pretty much with those which we have advanced. Unity of management we have always advocated, but it has been with the idea that the Companies could accomplish this of their own free will and mere motion. All that the working men asked for last Wednesday, and Mr. Fawcett will ask for

to-morrow evening, can be accomplished by the Companies themselves. The working men want a constant supply of water at as small a cost as possible. They seem to have it in their minds that a Parliamentary Commission will furnish them with water at an extremely cheap rate. They are, we fancy, grossly deluded. No doubt, as Mr. Bateman put it, a large saving in working expenses can be made by unity of management, but nothing like to the extent that is commonly supposed. Directors may be abolished, and some Chief Engineers and Secretaries may be disposed of; but experience has shown that the economies effected in this way are long in telling upon the general expenditure of undertakings. Granted that some changes are required in the water supply of the Metropolis, our contention has always been that the Companies themselves can do all that is necessary.

The Indemnity Bill of the Metropolitan Board of Works, which is to justify them in paying the expenses of promoting their two Water Bills of last year out of rates, was, we may say, smuggled through the House of Commons at an early hour on Saturday morning, and was read the third time and passed at the afternoon sitting of the House. The Vestries did not put in even an appearance of opposition, perhaps because they knew there was no chance of success. The independent opponents, like Mr. Monk, were in a similar position, and thus a Bill which establishes a most dangerous precedent was carried through the Lower House almost without remark. The Standing Orders will, in all probability, be suspended in the House of Lords, so as to enable the measure to become law during the present session. The lesson will not be lost to the Metropolitan Board, who, when next they venture to attack the Water Companies, will be careful to take legal advice, and, we hope, act up to it.

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

THE EFFECT OF FROST ON GAS APPARATUS.

SIR,—Observing in your JOURNAL of July 29, a paper read at the recent meeting of the North British Association of Gas Managers, by Mr. Watson, Manager of the Stirling Gas-Works, on the effects of frost on gas apparatus, I was glad to hear that the plan adopted by him succeeded. In the New City Gas-Works, Montreal, Canada, which I have been connected with during the past five years, such a plan as Mr. Watson's would have been useless. Gas managers in this country generally have little trouble with frost; still I think the subject introduced by Mr. Watson deserves more consideration on their part than has generally been given, and, as it is better to be forearmed in case of any emergency, every gas-works, however small, should, in my opinion, be provided with the means of getting steam at their command, portable or otherwise.

Allow me to say that in Canada and the northern part of the United States, for about six months of the year steam is a necessity in gas-works in every department, both mechanical and chemical. The plan adopted in Montreal was by carrying 1-inch tubes round the tanks, as near as possible to the gasholders; valves being put on in various places, about 30 feet apart, for connecting flexible tubes for the lutes of the gasholders. In other places the plan adopted is a little different, although the results obtained are the same. Two small annular boilers, about 3 feet in length, and 1 by 8 feet in width, are sufficient for two gasholders 120 feet in diameter, getting water from the tank at the bottom of the boilers. Tubes connected at the top take hot water, with 1-inch tubes all round, about 4 inches under the water-line in the tanks. Other places have simply live steam as near as possible to the gasholders, with a 1-inch tube about 4 inches in the water of the tank, without pipes all round.

I hope that this subject may be still further ventilated.

Glasgow, Aug. 1, 1879. HUGH BAILLIE.

THE PUMPING OF TAR.

SIR,—Having noticed in your JOURNAL for the 29th of July ult., a letter from "B. A. T." on the above subject, we should recommend for the work specified a pump driven at a slow speed, requiring no gearing or valves in either the suction or delivery pipes, which, for the work required, should be kept 4 inches in diameter throughout the whole distance, and be buried in the ground, or otherwise covered, to prevent the tar from thickening in cold weather. A pump such as we here allude to has been working for the last eight months in a London gas-works, drawing from a vertical depth of 18 feet through 80 feet of horizontal suction-pipe, and forcing the tar a distance of 280 feet. This pump delivers from 8000 to 9000 gallons of tar per hour.

BARTRUM AND POWELL.

Cornwall Buildings, 35, Queen Victoria Street, E.C.,
Aug. 8, 1879.

THE DRONFIELD LOCAL BOARD AND THE GAS COMPANY.—At the usual meeting of the Dronfield Local Board last Wednesday, a letter from the Dronfield Gas Company was read, bearing upon the matter of lighting the town during the next season, together with an agreement containing the conditions on which the Company would supply gas to the town lamps. Mr. Barker suggested that it would be a good plan to allow the town to be in darkness, and Mr. Silcock proposed that the winter pass over without gas. He thought that, taking into account the exceptionally poor circumstances of the town, it would be a boon to save the money. Mr. Ashton seconded Mr. Silcock's proposition, which was carried unanimously.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, AUG. 4.

Knutsford Light and Water Bill,—read the third time, with the amendments, and passed.

TUESDAY, AUG. 5.

Derby Improvement Bill,—read the third time, with the amendments, and passed.

HOUSE OF COMMONS.

THURSDAY, AUG. 7.

THE SUPPLY OF WATER TO THE EAST END OF LONDON.

Mr. MORLEY, on behalf of Sir John Lubbock, asked the President of the Local Government Board if his attention had been called to the insufficiency of the supply of water to the poor, and especially to the occupiers of artizans and labourers dwellings in the East London Water Company's district; and if he would cause an inquiry to be instituted with respect thereto, and also to the powers vested in the East London Water Company, by which they declined to deliver water at a greater height than 40 feet, with a view to remedial measures being adopted.

Mr. SCLATER-BOOTH said he had made inquiry into the subject, and had been informed that it was not the fact that complaint had been made by or on behalf of the poor people at the East-end of London, with regard to an insufficient supply of water. Complaints had been made from time to time, but there had been no recent expression of complaint, so far as he was aware. A complaint had recently been made by the Improved Industrial Dwellings Company to the effect that certain buildings which they had adapted for the poorer classes were not adequately supplied with water. The East London Water Company contended that the supply was actually in excess of their parliamentary obligations; and they also alleged that the Industrial Dwellings Company had declined to make arrangements suitable for the reception of the water. However that might be, certain it was that the East London Water Company were not, under their Act, bound to furnish water to a higher level than 40 feet.

METROPOLITAN BOARD OF WORKS (WATER EXPENSES) BILL.

Bill considered in Committee. Amendments made, and progress reported. Committee to sit again on Friday, Aug. 8.

A petition against the Bill was presented from London.

FRIDAY, AUG. 8.

METROPOLITAN BOARD OF WORKS (WATER EXPENSES) BILL,—further considered in Committee, and reported. As amended, to be considered on Saturday, Aug. 9.

SATURDAY, AUG. 9.

METROPOLITAN BOARD OF WORKS (WATER EXPENSES) BILL,—as amended, considered; and amendment made. Bill read the third time, and passed.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

THE AMALGAMATION OF THE SOUTH METROPOLITAN AND THE SURREY CONSUMERS GAS COMPANIES.

DEPUTATION TO THE BOARD OF TRADE.

On Friday last a deputation from the Vestry of Lambeth, accompanied by Mr. W. H. Michael, Q.C., Mr. G. W. Stevenson, C.E., and Mr. Wakefield, Parliamentary Agent, had an interview with Mr. J. G. Talbot, M.P., at the Board of Trade, with reference to the scheme now before the Board for the amalgamation of the South Metropolitan Gaslight and Coke Company and the Surrey Consumers Gas Company. The chief objection of the Vestry to the amalgamation scheme was that the effect of it would be to reduce the price of gas to the consumers in the Surrey Consumers Company's district, and deprive the Vestry and the consumers in the South Metropolitan Company's district of the advantages they now derive from the favourable position of the South Metropolitan Gas Company; as the Surrey Consumers Company now charge 3s. 9d. per 1000 cubic feet for gas, while the South Metropolitan Company only charge 3s., and it is proposed by the scheme to reduce the price of gas in the united district to 3s. 2d., and ultimately to 3s.

Mr. TALBOT said he would take the representations of the deputation into his most careful consideration.

The deputation then withdrew.

CLEVELAND WATER COMPANY.—The twenty-second ordinary half-yearly meeting of this Company was held at the Offices, Saltburn-by-the-Sea, on Thursday last—Mr. J. T. Wharton in the chair. The Directors report showed a disposable balance of £2136, out of which dividends at the rate of £6 10s. per cent. per annum on the original and A shares, and £4 11s. on the B shares, free of income-tax, were recommended. This would absorb £1838, and leave a balance of £298 to be carried forward, whilst the reserve-fund would still stand at £2750. On the motion of the Chairman the report was adopted, and the dividends recommended were declared. In moving their adoption, the Chairman stated that the new reservoir at Skelton might be expected to be completed in three months, and he added that the falling off in the dividend was chiefly due to the effect of the late strike of Durham miners, which had for a time closed some of the iron mines, and the consumption of water had been reduced by about 4 million gallons, causing a loss of revenue to the Company of about £150. The usual vote of thanks to the Chairman terminated the meeting.

TRURO WATER COMPANY.—The half-yearly meeting of this Company was held on the 7th inst.—Mr. A. C. Willyams in the chair. The Directors in their report expressed regret that owing to the delay in the construction of the works the city was still unsupplied with water; but that they had taken possession of the works, which they intended to complete forthwith, and they confidently hoped that the water would in a short time be brought into the city. The accounts showed a total amount expended of £13,415 15s. 7d. The Engineers reported that the mains near the Union had been completed, additions to the engines made, portions of the machinery delivered, and the buildings, excepting certain small details, completed. The Chairman, in moving the adoption of the report, said that the Directors at their meeting in February were led to suppose that water would be in the city in two or three months from then. He regretted that it was not so; but he saw no reason why it should not be now in three or four months. Mr. Henderson confirmed the statement in the report that the works would be completed and the water in the city this year. The report was adopted, Mr. Henderson was re-elected a Director, and Mr. M. Courtenay as Auditor.

YEOVIL GAS AND COKE COMPANY.

The Annual General Meeting of this Company was held on Monday, the 28th ult., when the following report was presented and adopted:—

In presenting their annual statement of accounts, your Directors have to congratulate the Shareholders on the continued prosperity of the Company.

The balance of profit and loss amounts to £1831 7s. 4d., from which your Directors recommend a dividend of 10 per cent., carrying forward £349 17s. 4d. to next year's account.

The new buildings and plant, mentioned in the last report, have been completed in a satisfactory manner, and have proved of the greatest benefit during the past severe winter.

The Company's works are in good order throughout.

Dr.—*Profit and Loss Account, June 30, 1878, to June 30, 1879.*

Expenditure.

To Tools and sundries		£68	4 3
Wages and salaries, gas manufacture, and public lamps		598	2 9
Coal and cannel, 2025 tons (produced 19,768,600 feet)		1480	19 4
Retort and fire goods		127	13 8
Lime and oxide of iron		22	19 2
Meters—renewals and repairs		97	0 8
Printing and stationery		29	7 6
Repairs and renewals		488	17 1
Insurance		7	0 0
Stamps, carriage, and sundries		31	3 6
Mains, services, and fittings		261	9 1
Managing Directors and Directors fees		77	0 0
Rates and taxes		99	19 10
Interest		19	13 0
Returns, allowances, and bad debts		24	16 2
Sundry tradesmen's accounts		33	10 8
Secretary, Collectors, and Auditors		72	10 0
Hauling, carriage of coke, &c.		20	10 7
Balance available for dividend		1831	17 4
		£5392	14 7

Receipts.

By Gas-rental, by meter (16,551,600 feet)		£3578	4 0
Coke, tar, and liquor		666	9 8
Fittings		173	3 2
Rent of meters		136	2 6
Public lamps, consumed (1,938,000 feet)		437	16 0
Interest on reserve-fund, less tax	£19 1 8		
Interest allowed by bank	4 17 7		
		53	19 3
Premium on six shares sold		20	0 0
Balance from last profit and loss account	£1529 6 3		
Less dividends paid	1232 0 0		
		297	6 3
Balance from stock account		29	13 9
		£5392	14 7

At the close of the meeting, votes of thanks were passed to the Directors, Secretary (Mr. William Marsh), Manager (Mr. Edward Howell), and other Officers of the Company.

BELFAST CORPORATION GAS-WORKS.

At the Quarterly Meeting of the Town Council, held on Friday, the 1st inst.—the Mayor (J. Browne, Esq., J.P.) in the chair—the Gas Committee submitted their report and the accounts of the gas-works for the year ended June 30 last. They recommended that £20,000 be transferred from profit and loss account to the credit of the contingent and renewal fund, and that they be authorized to use that fund from time to time, as might be required, for extensions and improvements of the works. Also that the unexhausted borrowing powers of the Council, under the Act of 1874, might not be exercised without the special authority of the Council. They further recommended that the price of gas be reduced from 3s. 9d. to 3s. 6d. per 1000 cubic feet, the reduction to take effect from the 1st of July.

Statement of Accounts, for the Year ending June 30, 1879.

Dr.—*Capital Account.*

To Loans on mortgage—			
Amount, as per last statement		£454,029	0 0
Less 20th instalment to Bank of England, in advance	£11,000 0 0		
Less 19th instalment to Bank of England, in advance	11,000 0 0		
Less part of third instalment to Bank of England, remainder being paid out of sinking-fund	5,387 5 6		
Less sundry mortgages	11,250 0 0		
	£38,637 5 6		
Less extinction of loans, balance of third instalment of £11,000 repaid to Bank of England out of sinking-fund	5,612 14 6		
		44,250	0 0
		£409,779	0 0
Add amount borrowed during the year		39 819	0 0
		£449,598	0 0
Perpetual annuities		2,245	14 11
		£451,843	14 11
Balance		40,459	9 4
		£492,303	4 3

Cr.—*Capital Account.*

By Expenditure to June 30, 1878	£441,539 10 5		
Meter investment	37,387 8 10		
		£478,926	19 3
Additional outlay—			
New mains and service-pipes	£3,325 13 3		
New scrubbers (new section), with foundations, valves, connections, and staircases, &c., for same	3,048 12 10		
Hydraulic apparatus, consisting of lifting-gear for purifiers, lime hoist, capstan for hauling barges, pressure-pipes for conveying power to new section of works, and sundries	963 8 1		
New bench of 140 retorts (new section) complete	3,989 14 3		
New floors, beams, &c., for same, and fixing in engine and exhauster houses	447 2 9		
Foundation for new condensers, coal-shed, purifiers, &c., now in progress	316 18 4		
Flagging and paving in front of works, &c.	486 6 9		
Sundries, including freight, plumber's work, &c.	185 7 7		
		12,763	3 10
New meters		613	1 2
		£492,303	4 3

Dr.—*Revenue Account.*

To Sale of gas*		£79,450	12 8
Less discounts	£4,493 0 3		
Less bad debts	454 6 11		
	4,947 7 2		
		£74,503	5 6
Public lighting and under agreements		9,774	19 10
Residual products—			
Sales of coke and breeze, less labour, &c.	£15,463 4 4		
Fuel for steam-boilers, &c.	646 3 2		
		16,109	7 6
Sales of tar		5,951	0 0
Sales of ammoniacal liquor		4,715	3 7
Rents		103	7 6
Gas-rents recovered (formerly written off as bad)		3	17 8
Law costs refunded		6	13 10
		£111,167	15 5

Cr.—*Revenue Account.*

By Coals (50,338 tons), including dues, carriage, unloading, and all expenses of depositing same on works		£36,439	18 3
Purification and sundries (including labour, £640 8s.)		1,592	11 3
Salaries of Engineer and Assistant		795	16 8
Wages (carbonizing)		6,190	19 3
Repair and maintenance of works and plant (including renewal of retorts), machinery, apparatus, tools, material, and labour		5,142	6 0
Fuel for steam-boilers, &c.		646	3 2
Distribution of gas—			
Salaries of Chief Inspector, Inspectors, and Clerks in department		894	3 4
Repair, maintenance, and renewal of mains and service-pipes, including materials, laying and paving, and labour		629	7 9
Repairing, renewing, and refixing meters		3,268	4 6
Public lamps—			
Lighting and repairs		2,495	11 11
Rents, rates, and taxes—			
Rents		135	0 0
Rates and taxes		2,512	13 5
Salaries of Cashier, Accountant, and Clerks, Office-Keepers, and Messengers		1,648	2 6
Salaries of Collectors		850	0 0
Stationery and printing		264	6 2
General establishment charges and incidental expenses		345	6 0
Audit-fund		42	0 0
Law charges		10	13 1
Balance carried to net revenue account		47,264	12 2
		£111,167	15 5

Dr.—*Profit and Loss (Net Revenue) Account.*

To Balance from last year's account		£17,765	7 0
Balance from revenue account		47,264	12 2
Bankers interest		40	4 7
		£65,070	3 9

Cr.—*Profit and Loss (Net Revenue) Account.*

By Amount carried to renewal and contingency fund		£16,000	0 0
Amount handed over to Parks Committee		1,000	0 0
Interest on loans and annuities for the year ending June 30, 1879		19,988	12 10
Amount carried to sinking-fund		5,154	14 0
Balance, consisting of balance from last year's account	£17,765 7 0		
Less carried to renewal and contingency fund	16,000 0 0		
	£1,765 7 0		
Less handed over to Parks Committee	1,000 0 9		
	£765 7 0		
Net profit on year's working	27,316 3 11		
	£28,081 10 11		
Less carried to sinking-fund (as above)	5,154 14 0		
		22,926	16 11
		£65,070	3 9

Dr.—*Renewal and Contingency Fund.*

To Balance from last year's account		£24,000	0 0
Amount brought from profit and loss account		16,000	0 0
		£40,000	0 0

Cr.—*Renewal and Contingency Fund.*

By Balance		£40,000	0 0
		£40,000	0 0

Dr.—*Sinking-Fund.*

To Balance from last year's account		£9,837	14 6
One year's interest on £9837 14s. 6d., at 4½ per cent.		442	14 0
Amount brought from profit and loss account, being 1 per cent. on amount borrowed, and 1-100th part of capitalized annuities		4,712	0 0
Interest allowed on cash in bank		8	8 5
		£15,075	16 11

Cr.—*Sinking-Fund.*

By Balance		£15,075	16 11
		£15,075	16 11

Dr.—*Balance-Sheet.*

To Balance from revenue account		£22,926	16 11
Balance from renewal and contingency fund account		40,000	0 0
Balance from sinking-fund account		15,075	16 11
Sundry amounts due for interest accruing, new machinery, &c.		3,511	8 11
		£81,514	2 9

Cr.—*Balance-Sheet.*

By Balance from capital account		£40,459	9 4
Cash at Bankers		15,081	19 9
Value of stocks in hand—			
Coal	£4,060 0 0		
Coke and breeze	1,150 0 0		
Ammoniacal liquor	340 0 0		
Main-pipes, &c.	2,371 12 9		
Sundries	2,220 19 11		
		10,042	12 8
Accounts due for gas	£9,960 18 7		
Accounts due for meter-rent (arrears)	7 13 8		
Sundry accounts for coke, tar, &c.	3,571 1 8		
Sundry accounts for service-pipes	213 19 11		
		13,773	13 10
Sundries, including harbour lamp account (£329 16s. 8d.), &c.		908	19 4
Half year's taxes unexpired, carried forward		1,547	7 10
		£81,514	2 9

* Price of gas, 3s. 9d. per 1000 feet, subject to discounts from 2½ to 20 per cent. No meter-rent.

Quantity made	513,976,000	cubic feet.
Quantity sold	471,338,000	,,
Quantity used on works, &c. (estimated)	4,000,000	,,
Total quantity accounted for	475,338,000	,,

Sir JOHN SAVAGE, in moving the adoption of the report, said: Mr. Mayor, it is with a feeling of real gratification and some not unjustifiable pride that I have to lay before the Council the facts and figures upon which the satisfactory recommendations in the report now presented are based. In the course of the last five years, during which the Council have had the control of this vast undertaking, I have seen with pleasure my most sanguine anticipations confirmed, and even surpassed, by the actual profits realized. I hope to be able to prove that great and substantial advantages have accrued to the town by the corporate control of the gas-works, and that still greater advantages will flow in the future from the same cause, and that the courage of the Council in assuming such a vast responsibility, and the assiduity of the Gas Committee in their supervision, have been followed by a full, complete, and an assured reward. The real attraction of the entire statement lies in the fact that, after maintaining the works in thorough repair and working order, providing the annual sinking-fund, which we are compelled, by Act of Parliament, to set aside, amounting to £5154 14s., there remains a surplus profit to be disposed of, amounting to £22,926 16s. 11d. In the year ended in 1875, the net profits were £13,915 1s. 5d., which, however, included a balance from the old Company of £2243 15s. 4d., leaving the net amount £11,671 6s. 1d.; for the year ended July 1, 1876, £7949 9s. 2d.; 1877, £11,460 4s. 9d.; 1878, £20,957 6s. 2d.; 1879, £27,316 3s. 11d.—total, £79,354 10s. 1d. There is, therefore, clear and indisputable evidence of growing prosperity and increasing profits. If the recommendations contained in the report are sanctioned by the Council, the sum above stated will be disposed of as follows:—£15,075 16s. 11d. will stand at the credit of the sinking-fund, and £60,000 at the credit of the renewal and contingency fund, exclusive of £1000 which has been paid to the Parks Committee, and the balance, amounting to £2926 16s. 11d., carried to next year's accounts. The quantity of gas manufactured in each of the above years is as follows:—1875, 418,676,000 cubic feet made, 375,923,000 feet sold; 1876, 467,317,000 cubic feet made, 411,669,000 sold; 1877, 476,754,000 cubic feet made, 414,212,220 sold; 1878, 482,186,000 cubic feet made, 443,687,000 sold; 1879, 513,970,000 cubic feet made, 475,338,320 sold. So that the gross increase is little short of 25 per cent. in five years. But if you consider the dark cloud that has hung over our town for the whole of that period, blighting its industry and marring its commerce, this increase is simply marvellous. In the distribution of this vast quantity of gas, the diminution in the percentage of loss is highly noteworthy. The percentage of loss in 1874—the last year of the old Company's management—was 12½; this year it is 7·49, or nearly 5 per cent. less, which means close upon £4000. We hope, by close inspection of meters and vigilant attention to service-pipes, to bring it down to 6 per cent., which is as low as anywhere in the United Kingdom. During the period embraced within these returns, we have seen coal delivered into the works costing 24s. per ton, and reduced to 14s.; and, assuming our consumption to be 50,000 tons, that left a clear balance on this head of £25,000 last year. It would be wrong, however, to conclude that the whole of this amount was available for the reduction of the price of gas. In 1875, when coals were 24s., coke was 4½d. per bushel. Last year, with coal at 14s., coke was value for only 2½d.; and, assuming 9s. per ton of coal to be the net amount realized for coke in 1875, the ton of coal cost 15s., with gas at 4s. 6d. per 1000 feet; whereas last year the coke realized but 5s., and the coal stood at 9s., with gas at 3s. 9d. per 1000 feet; the difference, therefore, in coke amounted to no less a sum than £10,000, while the reduction of 9d. per 1000 feet means a sum little short of £17,000, thus absorbing the entire advantage resulting from the altered value of coal. The advantageous contract made for our supply of coal this year, together with the hope that trade may revive, and the prosperous condition of the works generally, have led the Committee to recommend a reduction of 3d. per 1000 feet, thus making the price of gas 3s. 6d.—a figure which is lower than it ever stood at before, and which means a loss to the Committee of nearly £6000 in profits. Taken in connection with the fact that no meter-rent is charged by us, which in nearly every other town is regarded as value for 2d. to 3d. per 1000 feet, it brings us, in the case of large consumers, almost as low as any town in the United Kingdom, and quite as low as the great Metropolitan Companies. The illuminating power of the gas has been steadily kept up to nearly 18 candles, the parliamentary standard being 16. I maintain, therefore, that for the past five years our town has been as well lighted, and at as low a cost, as it could have been under the old Company, while we have made the substantial sum of £79,000 to fall back upon in case of any sudden calamity or emergency befalling the works. How far corporations are justified in making profits out of gas consumers, and giving an advantage, at their cost, to the general body of ratepayers, which is based on the assumption that the surplus profits are applied to public purposes, is a question that admits of great contention. I confess that I incline strongly to the opinion that the gas enterprise was undertaken with the intention not of making large profits, but of giving a better quality of gas at a less cost than was possible under the old *régime*. But, on the other hand, if we are able to give as good an article as is being given in other towns, and at a much less price, and by excellence of management still secure a large profit, it may be considered a highly praiseworthy thing to improve our town from a source so easy of attainment, and so spread over the greater portion of the inhabitants. But there is a still stronger argument in favour of the course we are pursuing, based on this consideration—namely, that if the gas consumer conceives he has a right to all the present advantages of cheap coal, so as to leave no profit at all, and gas-works become superseded by the electric light, or any other illuminating agent, and the general body of ratepayers have to sustain the loss consequent thereon, will the actual consumer repay any of the money he gained by his cheap supply, or would he not rather look to the town to recoup the great loss which must of necessity fall upon the ratepayers generally, and not upon the consumers merely? In Manchester an immense sum is carried over annually to the credit of the rates for the improvement of the city. The Leeds Corporation also have contributed to lessen the rates from the profits of their gas supply; but then the coal is supplied there for 6s. 9d. per ton, while our coal costs double that figure. I hold in my hands the accounts of the Bradford Corporation Gas-Works for the past year, in which an epitome is given of the working of their gas undertaking for 7¾ years. During that time an average of profits was made amounting to £171,000 per annum, or £127,650 of a total, and of that sum £99,500 was applied to public purposes; so that if we decide to do the same here, we shall be only following the practice adopted elsewhere. Now, it is tolerably certain that, low as is the price of gas, so long as coal remains exceptionally cheap we cannot fail, with ordinary good management, to secure a large sum annually in the shape of profits. The wisdom of keeping a large contingent reserve-fund is too apparent to require any argument. We are engaged in manufacturing an article which may be superseded by some other light. In an interview that I had a few days ago with some of the leading members of the Leeds Corporation, I asked how they felt with regard to the electric light, and they seemed to think that no immediate danger existed, and that a wide field for consumption for gas lay in its employment in cooking apparatus and as motive power for small engines. We intend, if possible, to have this autumn an exhibition of gas apparatus of various kinds, which we hope may prove attractive and useful. We also intend to increase the illuminating power of a large number of the public lamps in the leading thoroughfares of the town, which will greatly contribute to the comfort and convenience of the inhabitants, and serve as an advertisement for the sale of our gas. The surplus profits are yet to be disposed of. I respectfully submit, for the calm and deliberate consideration of the Council, that, assuming our profits for the coming year to be more than £20,000, no more legitimate, wise, or unobjectionable application could be made of at least £10,000 than to pay the interest on £250,000 which must be laid out in completing the scheme for sewering and draining our town, which has fallen into abeyance for some time past, but will force itself speedily to the front until it is finally disposed of. No matter how self-complacent we or any other public corporation may be, this matter, which affects the sanitary condition and health of 220,000 people, must not be any longer overlooked. The balance may be spent in a covered market, in the improvement of the streets, or in any way the Council may deem most necessary. I desire, before concluding, to say a word on behalf of the Committee—to express the satisfaction they feel with the chief officials, especially the Manager, Mr. Stelfox, and the chief of the collecting staff, Mr. Turnbull, who have brought to bear upon their work an amount of knowledge and zeal worthy of the greatest praise. I hope that, without an excess of vanity, it may be said that something is due to the Gas Committee for their untiring and unremitting exertions. I can truly say that their labours have been both arduous and anxious, and that in the case of some, at least, they have been performed under a deep sense of public duty, which has involved a considerable sacrifice of domestic ease and personal interest; and we now await the decision of the Council with regard to the important report before them. Permit me to say one word more, and that is personal to myself. When, a year ago, I was waited upon by a deputation, or rather received a large number of names of gentlemen, asking me to permit myself to be re-elected to this Council, I felt that the arguments put before me were such as to induce me to yield to their entreaties. I have felt since that I ought not to have done so, that my own health and comfort demanded complete relief from all public duties, which I have for a long period striven to the best of my ability to discharge, and especially during the last few years in connection with the gas trust. I think, however, it is now in such a position that, if only looked after with moderate care and attention, and if the lines I have indicated be followed, it will be a very great success, and a very great advantage to the town. But I must now request the Council to consider me no longer the Chairman of the Committee, and no longer responsible for the control of any portion of this vast undertaking. I do so out of a feeling that my bodily health is not equal to it. I feel very much obliged for the courtesy which the Council have always extended to me; and I may say this, that when I received honours, I did not desert my colours and run away. I trust I may now be permitted to retire from the Chairmanship of the Gas Committee. I may not retire from the Council; but I see many gentlemen around me who are competent to fill my place, and I hope and trust that you will accede to my request.

Mr. SUFFERN, in seconding the motion, said that Sir John Savage's statement with regard to the gas trust was most satisfactory. The pleasure, however, which he (Mr. Suffern) felt in seconding the adoption of the report was much diminished by the concluding observations of the mover, and he hoped that he would re-consider his proposal to retire, seeing it was owing so greatly to his exertions that the gas-works stood in their present prosperous condition. His (Sir John's) remarks panegyrizing the members of the Committee for having brought the gas-works to their present condition were peculiarly appropriate to himself, for, as Chairman of the Committee, he had been unremitting in his attention to the interests of the trust. It was the unanimous feeling of the Corporation that the gas-works without Sir John Savage would not be in the position they then were. He did not believe they could get a gentleman like Sir John to sacrifice his time to the development of this great undertaking, and who would be qualified to follow in his footsteps. And he hoped it would be many a year before it would be necessary to appoint another Chairman. He could quite understand their giving him assistance by appointing a Vice-Chairman; but he hoped that Sir John would continue to occupy the position which he had so long held with such credit to himself and advantage to the town, and that he would still give them the benefit of his counsel in directing the affairs of this important trust.

Mr. HAZLETT also bore testimony to the valuable services rendered by Sir John to the trust. He did not think he was outstepping the truth when he said that there were many men in Belfast receiving £2000 a year as directors of joint-stock companies who did not do half the work which Sir John Savage, as Chairman of the Gas Committee, did gratuitously. He hoped they would have the benefit of his services for a long time to come.

Mr. HARVEY expressed his sorrow to hear Sir John Savage's concluding remarks, and said he did not see how the Gas Committee could do without him.

Mr. GAFFIKIN, Mr. JENKINS, Mr. GREGG, and Mr. ADAMS also spoke in highly eulogistic terms of the services rendered by Sir John to the trust, and hoped he would not think of retiring from the chairmanship.

Sir JOHN SAVAGE said he felt deeply the kindness of the Corporation. He would not have mentioned the subject of retirement, but that one of the highest medical gentlemen in England had told him that if he persisted in pursuing the course he did, in attending to public matters, he would not be answerable for the consequences. He regretted to have to say so, but he could not alter the decision, which he had arrived at after calm deliberation. However anxious he was to serve their interests, he could not, consistently with the duty he owned to his family, continue as Chairman of the Committee; he would not, however, withdraw from the Council, but would still try to render them any service in his power.

The MAYOR said he was one of the oldest members of the Committee. After the statement which Sir John had made, they could not expect that he would give the same amount of attention to public matters as formerly, but he would request him to allow his name to be used as Chairman of the Gas Committee till the end of the year.

Sir JOHN SAVAGE said he could not resist the appeal made by the Mayor, and consented to his request.

The report was then adopted.

THE GAS-BURNER MAN.—At the Hammersmith Police Court last Saturday, a man giving the name of George Osmond, described as a gas-fitter and engineer, living at Ryde, Isle of Wight, was charged, before Mr. Bridge, with attempting to obtain money by false pretences. Colonel Rich, Railway Inspector to the Board of Trade, residing at 17, Queen's Gate Terrace, Hyde Park, said that on Saturday morning the prisoner introduced himself by representing that he had come from the Engineer of the Gas Company, and showed some burners which he wished him to adopt, as they effected a saving in the consumption of gas. He found that the man was an impostor, and went with him till he saw a constable. At first he thought the prisoner had come for the quarter's gas bill, and was about to pay him, when he announced the nature of his business. Mr. Bridge said it was useful to society to know that a man was going about in this way, but it was not a matter which could be sent for trial. He discharged the prisoner, and gave the police instructions to watch him.

SALFORD CORPORATION GAS SUPPLY.

The Quarterly Meeting of the Salford Borough Council was held last Wednesday—the EX-MAYOR (Alderman Walmsley) presiding—when the General Gas Committee presented the following report on the working of their department for the year ended March 25, 1879 :—

To the Council of the Borough of Salford.

The Gas Committee present the following statement and report on their department for the year ending March 25, 1879 :—

—	Made in Cubic Feet.	Sold and Used in Cubic Feet.	Leakage in Cubic Feet.	Leakage per Cent. on Make.
Quantity of gas in above period	715,676,000	615,694,738	99,981,262	13·97
Corresponding do. last year	650,512,273	553,476,062	97,036,211	14·92
Increase	65,163,727	62,218,676	—	—
Increase per cent.	10·02	11·24	—	—

The average illuminating power of the gas, as tested by Dr. Angus Smith, has been equal to 20·01 standard sperm candles.

—	Within the Borough.	Outside the Borough.	Total.
	£ s. d.	£ s. d.	£ s. d.
Rental from private consumers for gas	78,907 9 1	21,282 13 7	100,190 2 8
Meter-rents	2,286 8 0	441 4 0	2,727 12 0
Public lamps	9,161 15 10	1,371 19 10	10,533 15 8
	90,355 12 11	23,095 17 5	113,451 10 4
Corresponding period	87,127 13 6	22,628 7 3	109,756 0 9
Increase, notwithstanding reduced price	3,227 19 5	467 10 2	3,695 9 7

—	This Year.	Last Year.	Increase.	Increase per Cent.
Number of hired meters in use	15,614	15,293	321	2·10
Ditto consumers own meters	9,304	9,394	90 dec.	0·96 dec.
Total number of consumers	24,918	24,687	231	0·94
Ditto public lamps	5,871	5,579	292	5·23
Ditto consumers and public lamps	30,789	30,266	523	1·73
Number of new and additional service-pipes laid to private consumers	1,794	1,427	—	—
Number of new and additional lamp service	360	313	—	—

During the past year your Committee have laid an additional 26,694 yards of new mains, also 9696 yards of new mains which replaced others of less dimensions. A summary of the same is appended.

The gross profit of the past year is £44,573 4s. 8d., compared with £39,465 11s. 3d. in the preceding 8 months and 25 days, and it is appropriated as follows :—

To Interest on mortgage debt and deposits		£11,887 19 1
Sinking-fund		6,518 11 11
Annuity to the Salford district		2,530 0 0
Depreciation-fund general account, at 3 per cent.		9,702 10 4
Depreciation-fund hired meters account, at 12 per cent.		2,866 2 2
Arrears of contributions to the depreciation-fund general account, part payment		1,063 1 2
The remainder constitutes the divisible profits, and amounts to the sum of £10,000, which has been apportioned as follows, proportionately with the consumption of gas in each district :—		
To the Salford district	£5,609 3 7	
,, Pendleton district	2,373 11 7	
,, Broughton district	2,017 4 10	
		10,000 0 0
		£44,573 4 8

The department has been favoured by continued prosperity. There has been a considerable increase in the consumption of gas, which, with economy in the management, has resulted in increased profits. This has enabled your Committee to recommend another reduction in the price of gas, making altogether three reductions within three years, representing within the borough 8d., and outside the borough 10d. per 1000 cubic feet.

(Signed) WILLIAM SHARP, Chairman.

Gas-Works, Salford, July 23, 1879.

[APPENDIX.]

Main-Pipes, Extensions, and Replacements During the Year ending March 25, 1879.

Extension of Main-Pipes in	2-In.	3-In.	4-In.	5-In.	6-In.	7-In.	8-In.	9-In.	Total Yards.
Salford	71	1157	1468	435	601	40	—	—	3772
Pendleton	295	1930	955	678	725	—	1092	60	5735
Broughton	—	1057	455	12	—	—	34	—	1558
	366	4144	2878	1125	1326	40	1126	60	11065
Outside the borough	1650	4036	1906	1717	1280	—	5040	—	15629
Total yards	2016	8180	4784	2842	2606	40	6166	60	26694

Main-Pipes replacing others of a Less Diameter in	3-In.	4-In.	5-In.	6-In.	8-In.	9-In.	12-In.	18-In.	Total Yards.
Salford	95	385	171	260	72	—	—	—	983
Pendleton	75	596	18	817	1535	—	100	—	3141
Broughton	210	384	346	1024	169	—	548	1072	3753
	380	1365	535	2101	1776	—	648	1072	7877
Outside the borough	135	63	—	—	1531	—	—	—	1729
Total yards	515	1428	535	2101	3307	—	648	1072	9606

SAMUEL HUNTER, Assoc. Inst. C.E., Engineer and Manager.

Gas-Works, Salford, July 23, 1879.

ABSTRACT OF ACCOUNTS, FOR THE YEAR ENDING MARCH 25, 1879.

DR.—*Capital Account.*

	Expenditure to March 25, 1878.	Expended this Year.	Total Expenditure.
To Lands acquired, including law charges	£22,526 10 0	—	£22,526 10 0
New buildings, manufacturing plant, machines, storeage works, and other structures connected with manufacture	173,341 9 9	29,099 15 0	202,441 4 9
New main and service-pipes (not being in place of old ones), including laying same, paving, and other works connected with distribution	116,743 7 5	10,004 14 4	126,748 1 9
New meters (not being in place of old ones), including fixing	21,372 17 0	1,652 2 7	23,024 19 7
	£333,984 4 2	£40,756 11 11	£374,740 16 1

CR.—*Capital Account.*

	Receipts to March 25, 1878.	Received this Year.	Total Receipts.
By Loans on mortgage	£284,921 9 4	—	—
Less amounts repaid	17,537 3 3	—	—
	£267,384 6 1	£2,500 0 0	£269,884 6
Annuities capitalized, Salford district, 25 years purchase	63,250 0 0	—	63,250 0 0
	£330,634 6 1	£2,500 0 0	£333,134 6 1
Balance of capital account			41,606 10 0
			£374,740 16 1

DR.—*Revenue Account.*

To Manufacture of gas—		
Coals, including labour, carriage, cartage, and all expenses of depositing same on works	£48,554 6 6	
Carbonization—wages of stokers and foremen	11,996 0 2	
Purification, including £1116 4s. 4d. for labour	1,879 12 8	
Salaries—Indoor Superintendents and Analysts	785 4 0	
Repairs, works and plant — retorts, machines, apparatus, tools, materials, and labour, less old materials sold, £5 8s. 5d.	12,113 5 11	
		£75,328 9 3
Distribution of gas—		
Salaries—Outdoor Superintendents, Meter Inspectors, and Clerks at Rental Office	£3,149 18 5	
Repairs — main and service pipes, including materials, laying and paving, and labour	2,565 15 3	
Repairs, meters—fixing and repairing	631 16 0	
		5,347 9 8
Public lamps—repairing (net cost)		623 18 8
Rents, rates, and taxes—		
Rents	£352 1 6	
Rates and taxes	3,148 9 0	
		3,500 10 6
Management—		
Salaries	£1,370 11 1	
Collectors	1,388 6 6	
Stationery and stamps	385 0 3	
Incidentals	597 19 8	
		3,721 17 0
		£88,522 3 1
Bad debts (estimated)—		
Provision for same		1,849 7 6
		£90,371 12 7
Balance to credit of profit and loss		44,573 4 8
		£134,944 17 3

CR.—*Revenue Account.*

By Sale of gas—		
Consumers by meter	£100,190 2 8	
Public lighting	10,533 15 8	
	£110,723 18 4	
Rental of meters	2,727 12 0	
		£113,451 10 4
Residual products—		
Coke, less £506 11s. 10d. for yard labour and cartage	£6,552 11 7	
Tar	6,648 5 10	
Ammoniacal liquor	8,092 9 6	
		21,293 6 11
Rents		200 0 0
		£134,944 17 3

DR.—*Profit and Loss Account.*

To Interest—		
Mortgages	£11,509 17 11	
Bankers	355 13 2	
Depositors	58 5 9	
	£12,423 16 10	
Less interest on loan to Finance Committee	535 17 9	
		£11,887 19 1
Annuity—Salford district		2,530 0 0
Sinking-fund		6,518 11 11
Depreciation-funds—		
General—		
Annual appropriation £9,702 10 4		
Arrears 1,068 1 2		
	£10,770 11 6	
Hired meters	2,866 2 2	
		13,636 13 8
Balance of profits, distributed as under—		
Salford district	£5,577 9 10	
Pendleton district	2,343 1 0	
Broughton district	2,079 9 2	
		10,000 0 0
		£44,573 4 8

CR.—*Profit and Loss Account.*

To Balance brought from revenue account, being profit for year ending March 25, 1879	£44,573 4 8
	£44,573 4 8

DR.—*Depreciation Account, Works and Plant.*

To Amount expended this year	£6,434 9 7
Balance	31,990 9 11
	£38,424 19 6

CR.—*Depreciation Account, Works and Plant.*

By Balance from last year's account		£26,699 5 9
Profit and loss account—		
Current year	£9,702 10 4	
Arrears	1,068 1 2	
		10,770 11 6
Interest allowed by Bankers		955 2 3
		£38,424 19 6

Dr.—*Depreciation Account, Hired Meters.*

To Amount expended this year		£1,480 9 8
Balance		12,673 8 11
		£14,153 18 7

Cr.—*Depreciation Account, Hired Meters.*

By Balance from last year's account		£10,815 8 11
Profit and loss account		2,866 2 2
Interest allowed by Bankers		472 7 6
		£14,153 18 7

Sinking-Fund.

By Balance from last year's account		£19,792 11 9
Profit and loss account		6,518 11 11
Interest allowed by Bankers		116 0 2
		£26,427 3 10

Dr.—*General Balance-Sheet.*

To Depreciation-funds—			
General	£31,999 9 11		
Hired meters	12,673 8 11		
		£44,663 18 10	
Sinking-fund		26,427 3 10	
Bad debt fund		1,849 7 6	
Amounts owing, payable on demand—			
Interest accrued and unpaid	£1,143 11 5		
Sundry tradesmen, &c.	6,921 5 11		
		8,064 17 4	
Net profits, payable to districts—			
Salford	£5,609 3 7		
Pendleton	2,373 11 7		
Broughton	2,017 4 10		
		10,000 0 0	
Depositors—			
On gas and meter rental		7,220 12 1	
		£98,225 19 7	

Cr.—*General Balance-Sheet.*

By Balance of capital account			£41,606 10 0
Cash—			
To credit of sinking-fund	£8,517 17 4		
To credit of depreciation-funds—			
General	22,635 12 9		
Hired meters	10,048 6 0		
	£40,601 16 1		
Less cash due to Bankers	£36,748 4 8		
Less cash due to Treasurer	1,181 17 0		
	37,930 1 8		
		2,671 14 5	
Stocks on hand—			
Coals	£2,000 0 0		
Pipes	4,953 0 11		
Sundries	636 1 0		
		7,589 1 11	
Gas and meter rental—			
Balances owing by consumers, including lamps		40,086 9 3	
Accounts owing for residuals, &c.		5,372 4 0	
		£98,225 19 7	

YORK UNITED GASLIGHT COMPANY.

The Seventieth Half-Yearly Meeting of this Company was held last Thursday—Mr. John F. Taylor in the chair.

The Secretary (Mr. C. Sellers) read the following report of the Directors:—

The result of the half year's working is satisfactory, and enables the Directors to meet the deficiencies of recent half years, when the profit would not permit them to add to the reserve-fund.

To provide for the growing demands for gas, the Directors are now remodelling the remaining portion of the Company's retorts. This will increase the carbonizing power 50 per cent., and exhaust the carbonizing space available upon the existing works. The Directors have also just concluded a contract for the erection of two scrubbers, which they believe will not only add to the efficiency of the Company's plant, but to the revenue. The extension and enlargement of mains during the half year have been a prominent item. 1041 yards of new mains have been laid, and 1257 yards of mains have been relaid with pipes of larger capacity.

In their last report the Directors referred to the purchase of additional land for the Company's proposed new works. They have now to report that they have secured the late Mrs. Singleton's property in Layerthorpe, known as Vicar's Terrace and Vicar's Row. This property will form a very valuable addition to the land previously purchased. A contract has been made, and the work is now in progress, for piling the river frontage of the new site preparatory to raising the land above the flood level.

Since the last meeting of the Shareholders, the Directors have had to regret the death of their late Chairman, Alderman Weatherley, the loss of whose valuable services to the Company they are sure will be felt by all who have an interest in its welfare. To supply the vacancy thus occasioned, the Directors, pursuant to the Company's Act, have elected Mr. William Wallace Hargrove, of this city—an appointment which they believe will be satisfactory to the Shareholders.

The Directors recommend the usual dividend of 5s. per share upon the old shares of the Company, and 1s. per share, or 5 per cent., upon the new shares, the same to be paid on and after the 12th inst., free from income-tax.

[The financial statement showed that the expenditure for the half year just closed amounted to £13,577 8s. 1d., and the receipts to £21,560 16s. 3d., leaving a balance on the half year of £7983 8s. 2d. The total balance to the credit of the Company was £17,323 14s. 10d., out of which £1000 has been added to the reserve-fund.]

The Chairman, in moving the adoption of the report, alluded to the death of the late Chairman, Alderman Weatherley, and said that those who were present at the meeting last February would remember that he was then in somewhat feeble health, but still they had the hope that the summer might restore him, and that his valuable services might be continued. They felt the loss more particularly because they were constructing new works, as to the due carrying out of which he was so well qualified, from his business knowledge and great experience, to give them all necessary advice. They as a Board felt his loss very severely. Consequent on the passing of the Company's Act of Parliament, they could now deal with the reserve-fund in a different way to what they could under the old Act, by which they were restricted to £5000. The new Act gave them power to raise it to a larger amount, and perhaps the reason why that power was given to them was that the price of their gas being restricted to 3s. 6d. per 1000 feet, they might, in the event of another coal famine, have to dip again into the reserve-fund, as they had had to do in times gone by. The Shareholders would see that the Directors had added this year £1000 to it. They had done so because for two or three half years past they were not able to put anything to the fund, but they were now glad to be enabled, by the improved finances of the Company, to add the sum named, thus making the fund all the stronger and more secure. This, he thought, all would heartily approve. The half year just closed had been an exceptionally good one, and of the two was the best. Generally they made more profit in what might be termed the first half year. It would perhaps be gratifying to know that the increase in the consumption of gas in the city during the past winter had been 14 per cent. over the previous corresponding period. There were several causes which had contributed to this increase. There was the long severe winter, the cold dark weather, in which a quantity of gas was consumed for lighting and warming purposes, and there had also been an increase in the number of gas-stoves fixed for cooking purposes. With reference to the new works, they were piling the ground adjoining the river, so as to place it out of the reach of the flood water; and perhaps the next thing they would have to do would be to erect a gasholder, which would have to be commenced next spring, and the tank portion completed during the summer. They had also had to make another and third outlet into the city from the works, in consequence of the increased demand. It would be in a great measure to supply the gas required for the new barracks, and that suburb of the city which was now being so rapidly filled with buildings. With regard to Mrs. Singleton's property, mentioned in the report, that was scheduled in their Act, and they took steps to purchase it, but the price asked was so outrageous and unreasonable that they thought they were better without it. It had since come into the market, and was then purchased upon what they thought were advantageous terms, and they were convinced it would be a great acquisition, because it gave them a much better and larger frontage. The coke-breaking machine which they had erected was working very satisfactorily. They found that the demand for coke for household purposes was increasing, and broken coke was much better for use than the ordinary large lumps. They still hoped and believed that the consumption would go on, and tend to the advantage of the Company. As to the general success of the Company, they had watched very closely during the past half year all the attempts at legislation, the proceedings of the Committees in the House of Commons, and of other Committees who had been making investigations with regard to the electric light, but they did not find that any substantial progress was made, and they still thought that gas would hold its own against it. They had every reason to believe that the prosperity they had had during past half years would continue, and that an article so cheap and so good as they gave to the citizens of York would continue to merit their favour and use.

Alderman Wilberforce seconded the motion, which was carried, and the dividends recommended in the report declared.

On the motion of the Chairman, the Directors were re-elected, and

Mr. J. F. Hill moved that a vote of thanks be given to them for their services. He observed that all the Shareholders united with the Board in the regret expressed at the death of the late Mr. Weatherley, whom they all esteemed very highly for the services he rendered the Company for many years. He congratulated the Board in their selection of Mr. Hargrove to fill the vacancy, adding that they were glad to see him present, and hoped that he might long live to serve the Company.

Mr. Rymer seconded the motion, and alluded with satisfaction to the results of the half year's work. He was also glad the Board had seen their way to add to the reserve-fund. In these days of excitement about the electric light, it would be a satisfaction to know that they had a fund in reserve to meet any deficiency which might take place.

The motion was carried unanimously.

The Chairman, in acknowledging the compliment, spoke of the great interest the Directors took in the Company, and expressed a hope that they would continue to merit the confidence of the Shareholders.

YORK NEW WATER-WORKS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held last Thursday—Mr. John F. Taylor presiding.

The Solicitor (Mr. J. P. Wood) read the report, which was as follows:—

The new works at Acomb Landing are now rapidly approaching completion, and the works connected with the diversion of the Acomb Beck are progressing rapidly.

The Shareholders will be asked, at the special meeting to be held immediately after the ordinary meeting, to authorize the creation of 2000 new shares of £10 each, such shares to be entitled, until Jan. 1, 1888, to a fixed dividend of 5 per cent. per annum, and after that date to rank *pari passu* with the ordinary share capital up to 7 per cent. dividend, which is the maximum allowed for capital created under the Company's Act, 1876.

The Directors recommended that a dividend of 5s. per share on the preference shares, being at the rate of 5 per cent. per annum; a dividend of 8s. per share on the ordinary shares, being at the rate of 8 per cent.; and a dividend of 3s. 6d. on the new shares of 1878, being at the rate of 5 per cent. per annum, for the past half year, be declared, and that the same be paid without deduction for income-tax on and after the 12th inst.

Appended was the following report of the Engineers, Messrs. T. and C. Hawksley:—

We have the pleasure to report that the new engines at Acomb Landing have been completed, and, after a satisfactory preliminary trial on Aug. 1, been brought into regular use for the supply of water to the city. The completion of these engines more than duplicates the pumping power previously existing, and the stand-pipe recently erected at the Severus Hill service reservoir enables water to be distributed throughout the Company's district at a considerably increased pressure during several hours of every day on which the engines are at work, thereby especially benefiting the inhabitants of the higher parts of the district. The only works yet remaining to be finished are those for the diversion of the Acomb Brook, the coal shoots, and the railway siding, all of which are rapidly advancing towards completion.

[From the statement of accounts it appears that the receipts on construction account, up to the 30th of June last, were—Calls on 8000 ordinary shares, £80,000; calls on 2000 preference shares, £20,000; amount of calls on 2000 £10 shares, £16,000; loans on mortgage £8500—total, £124,500. The payments were—New works at Acomb Landing, £3999 5s. 2d.; new engines, £2684 13s. 9d.; new houses, £600; pipe-laying, £465 10s. 7d. The sum of £120,086 5s. 5d. has been paid in expenses up to the end of December last, making a total outlay of £128,048 0s. 11d., or £3548 0s. 11d. more than the receipts; but this will be more than covered by the £4000 yet to be paid as the fifth instalment on the 2000 £10 shares. The revenue account showed that the half year's water-rents had realized £6294 17s. 3d.; sales of plumbers fittings, £445 11s. 8d.; plumbers fittings on hand on the 30th of June last, £102 8s. 4d.; stock used since the end of last year, £416 2s. 5d.; stock on hand on the 30th of June last, £392 18s. 1d. The payments included—Salaries and wages, £357 15s. 1d.; wages at Acomb, £250 1s. 10d.; coals for engines, £368 6s. 2d.; rates and taxes, including income-tax, £286 13s. 9d.; Directors, £225; repairs and cleaning of reservoirs, £236 19s. 1d.; repairs of mains and works generally, £511 19s. 1d. After meeting other items of outlay, there remained in hand £7622 10s. 6d. available for the payment of dividend and working capital.]

The Chairman moved that the report be received and adopted. He said that although there had been an increase in the water-rents, over the corresponding half year of 1878, of £60, yet there had been an increased expenditure, partly owing to the severe and protracted winter. The meters had been frozen up, and did not register the water, and the expenses of opening the blocks in the streets, and other matters, had made expenditure a heavy item. He commented upon the practice, prevalent during the last winter, of leaving the taps running to prevent freezing. This had entailed additional expense on the Company in pumping more water than usual, and the necessity for this unreasonable practice, he said, might be avoided if people would look well to the supply-pipes when laid, as it was owing to the scamping way in which some builders placed these pipes that they were sometimes frozen up. All this might be avoided. He was sorry to say they had not this half year a surplus profit sufficient to meet the usual dividend, but they had, of course, thought it right to appropriate the surplus profits of other years to make up the deficiency. It was a long time since they were in this position, and it would, he hoped, be long before they were so again. The Directors recommended the usual dividend. Having enumerated the various work done during the half year, he said the Company were continuing to supply the city with good, wholesome water, which would compare favourably with any town in the United Kingdom. The previous Friday (as noticed in another column

they started the new engines at the works, and the proceedings were very satisfactory. They hoped soon to have the whole of the improvements at the works at Acomb Landing completed. The works referred to were most satisfactory, and it would be a long time before any more engine-power was wanted.

Mr. J. L. FOSTER, Deputy-Chairman, seconded the motion, which was carried *nem. con.*

The CHAIRMAN moved, and Mr. J. L. FOSTER seconded, a resolution as to the payment of the dividends named in the report.

This was also agreed to, and the meeting was then made special.

The SOLICITOR read a formal resolution with regard to the creation of new shares, as mentioned in the report.

The CHAIRMAN, in moving the adoption of the resolution, said the Directors did not expect to require more than two calls. This would discharge all the obligations they were now under.

Mr. W. C. ANDERSON, J.P., seconded the motion. He remarked that it would be more convenient if they were allowed to pay the whole amount, instead of having calls, as was done by most companies with which he had been connected.

The CHAIRMAN replied that a call of £2 in October would meet all their obligations.

The motion was then put, and carried unanimously.

Mr. RYMER moved, and Mr. W. C. ANDERSON seconded, a vote of thanks to the Board of Directors for their services, which, he said, had been very onerous and most satisfactorily discharged.

The CHAIRMAN briefly acknowledged the compliment, and the meeting terminated.

CAMBRIDGE UNIVERSITY AND TOWN WATER-WORKS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held on Friday last—the Rev. Dr. OKES, Provost of King's College, in the chair.

The Directors report recommended a dividend on the consolidated stock and upon the first and second calls on the new shares for the half year ending July 6, 1879, at the rate of 10 per cent. per annum, payable on Sept. 1, leaving a balance of £137 18s. 11d. to carry forward, reducing the previous balance by £28 2s. 10d. They further stated that notice had been given by the executors under the will of the late Major Whyte-Melville, requiring the repayment of the mortgage of £7500 upon the Company's works on the 2nd of October next, and they had made arrangements with the Company's Bankers for the temporary provision of the amount necessary to pay off the mortgage. In order to repay £5000 of the sum thus temporarily borrowed, also to pay off the existing excess of expenditure on capital account and to provide for further expenditure up to the end of next year, the Directors had decided upon making a further call of £1 per share upon the £2 shares, to be made payable on the 6th of October next, and they had given instructions for the sale by public auction of the unallotted shares. The Directors also proposed that 5850 new £2 10s. shares be created, and a special meeting of the Proprietors would be called to consider that step, and also to authorize the conversion of the whole of the £2 shares into consolidated stock.

The Engineer and Manager (Mr. H. Tomlison) reported that during the past half year water from the Company's works had been laid on to 187 premises, the increased rental derivable from which was £168 per annum. The total number of premises now supplied was 7437, and the general condition of the Company's works continued satisfactory.

The CHAIRMAN, in moving the adoption of the report, referred to the loss the Board had sustained in the death of Dr. Pulling, the late Master of Corpus Christi College. Dr. Pulling had attended their meetings regularly, and from his ability and acquired knowledge was an extremely useful member of the Board. He was quite sure that they would all feel great sympathy with the family of Dr. Pulling. As regarded the last part of the report of the Directors, the measures which it was proposed to take had been minutely entered into, and the opinion of the Directors was that they might be safely adopted. During the late storm some derangement had been caused at their reservoir by the reflux of water which should have flowed away, and their water had consequently reached the town in a turbid state; but the surplus water had now been carried off, and, therefore, no alarm need be felt.

Mr. E. SMITH seconded the motion, which was agreed to.

The CHAIRMAN then moved, and Mr. CLAYTON seconded, the payment of the dividend as stated above.

The motion having been agreed to, a vote of thanks to the Chairman terminated the proceedings.

PROPOSED NEW GAS-WORKS AT NEWBURY.

On Friday, the 1st inst., an inquiry was held at Newbury, by Major TULLOCH, R.E., one of the Inspectors of the Local Government Board, in reference to the application made by the Town Council to the Board, under the Public Health Act, 1875, for authority to enable them to erect new gas-works on a plot of land adjoining the Great Western Railway.

In stating the case for the Corporation, the TOWN CLERK (Mr. H. B. Godwin) said that new gas-works were absolutely necessary, and it was impossible, on the present site of the works, to increase the manufacture of gas to the extent required for the enlarged borough. The site proposed was, however, a very suitable one. The existing works were last year transferred from the Gas Company, who had held the works by an uncertain tenure; and their lease having expired, the town considered it a fit opportunity for taking the works into their own hands. The Town Council had contracted for the purchase of a new site on the north side of the Great Western Railway, and it was estimated that the purchase of the Gas Company's works, and the erection of the new works now proposed, would be covered by a capital expenditure of £20,000. The purchase from the Gas Company amounted to £10,438.

The BOROUGH SURVEYOR (Mr. Sargent) said that the present site was surrounded by houses, while within a radius of 300 yards of the new site there were only nine houses. He considered the proposed site a very eligible one.

Alderman JACKSON (Chairman of the Gas Committee) stated that the present works were quite inadequate to supply the requirements of the town, and that they were also in a very bad condition. The Town Council had taken the opinion of a gentleman of great experience as to the gas-works, and he had recommended that a new and more eligible site should be obtained. The cost of the proposed site would be £450, and he (Alderman Jackson) was of opinion the interest of that amount would be recouped by letting the present site. There would also be an advantage as regards the cartage of coal. A plan had at one time been prepared for extending the present works, but he was of opinion that it would cost as much to reconstruct the works on the present site as to build new works on the site proposed.

Mr. J. G. O'FARRELL (Manager of the gas-works) said the rate of increase in the consumption of gas during the past six years had been 6 per cent. The present plant was defective, and quite inadequate to meet the requirements. Reconstruction of the works was absolutely necessary. The proposed site was one of the most eligible in Newbury, being close to the railway, and at a considerable distance from any household property. He estimated that the cost of erecting the new works would be £6000. They were very cramped for storeage room on the existing site, and compelled to pay for the storeage of coal elsewhere. The proposed site would be sufficient for the manufacture of gas for the town and district during the next 50 years. There would be a saving of £20 a year with regard to cartage, if the proposed site were obtained and a siding made into the works. He thought it essentially necessary that the works should be erected on the proposed site. He estimated the leakage of gas at 18 per cent. The present works might be extended to meet the requirements of the town for several years to come, if land could be obtained for the purpose, which he did not believe could be done.

Some objections to the proposed site having being raised, on the ground that the value of property in the neighbourhood would be depreciated by the erection of gas-works, and that the present works might be extended,

Major TULLOCH said the matter would be considered by the Local Government Board from a sanitary point of view.

Alderman LUCAS presented a petition, which he stated was signed by a large number of persons, including some of the largest ratepayers, against the proposed removal of the works. In supporting the prayer of the petition, he advocated the utilization of the present works, which could be done at a much less cost to the ratepayers than the erection of new ones. He urged that out of consideration for the ratepayers pockets, the scheme of the Town Council should not be sanctioned.

Major Tulloch then inspected the gas-works and the proposed new site, and no further evidence being produced on his return, the inquiry terminated.

LEEDS CORPORATION GAS SUPPLY.

A Special Meeting of the Leeds Corporation Gas Committee was held on Friday, the 1st inst.—Alderman BOWER in the chair—when the estimated revenue account of the Gas Department for the year ending June 30, 1880, was presented. It showed that, after reducing the price of gas from 2s. 6d. to 2s. 2d. per 1000 feet, there would still be a balance of £4724.

A proposal to reduce the price having been formally made,

Mr. SPARK, as an amendment, moved—"That, before recommending to the Council any further reduction in the price of gas, it is desirable to increase the illuminating power, to decrease the sulphur and other impurities, and to lower the meter-rents to small consumers." He contended that the public generally would prefer an improved gas to a decrease in price; that an increase in illuminating power would be both financially and physically advantageous; that the sulphur impurities in the gas were from 20 to 25 per cent. greater than they ought to be, and greater than in the London and Newcastle gas; and that the charges for meter-rent were excessive, being in the case of about 90,000 consumers no less than 20 per cent. per annum of the cost of the meters. In the case of the smallest consumers, he considered that an injustice was done them, seeing that, although the cost of the gas they burnt was in numerous instances below 10s. per annum (and in some cases only 5s.), yet they were made to pay 3s. per year for measuring that small quantity. By remedying these defects, and keeping the price of gas at 2s. 6d., he was convinced consumers generally would be well satisfied. The quoted price per 1000 feet, even if reduced to 2s. 2d., was quite delusive in comparison with the price charged in other towns. For instance, in Birmingham no meter-rent was charged, and, in addition to that set-off, no less than £25,000 per year was paid into the borough-fund, out of the gas profits, in reduction of the borough-rate. The income from meter-rents in Leeds was no less than £11,000 yearly, and if this were knocked off, the price of gas last year would have been 2s. 9d. per 1000 feet, instead of 2s. 6d.

The amendment was discussed at some length, it being admitted that a purer gas would be advantageous, and that a revision of the meter-rents was requisite; but it was urged that these should be dealt with at some future time, and that when the gas was improved in purity the consumers then should pay for it, and not the present consumers, who ought to be charged the cost price. The illuminating power, it was maintained, was already very good, and need not be increased.

The CHAIRMAN supported the principle of the amendment, especially as to the purity of the gas; but thought that a reduction of 2d. per 1000 feet could still be made.

On the vote being taken, Mr. Spark alone voted for his amendment.

The same fate befell an amendment to reduce the price of gas 2d. per 1000 feet, instead of 4d.; and the original proposition was then carried.

If the Council at their next meeting adopt this recommendation, the price of gas will be reduced, dating from the 1st of July last.

OPENING OF THE YORK WATER COMPANY'S NEW WORKS.

Very extensive new buildings and improvements have just been completed at the works of the York New Water-Works Company at Acomb Landing, by which the service of water to every part of the city will be very materially increased, and in this respect it may be safely asserted that no city or town in the kingdom will be in a more favourable position than York, having for some years had a continuous supply.

A new engine-house, 42 feet long, 21 feet broad, and about 40 feet high from the floor to the roof, has been erected, and also a boiler-house in connection therewith, in the Tudor style of architecture, with an ornamental chimney to harmonize therewith, the height of which is 115 feet. It is supported at the base by buttresses at each angle, and the upper portion is octagonal in shape, and terminates with a battlemented coping. The whole of these buildings are of brick with stone dressings.

In the new engine-house two powerful engines designed by Messrs. T. and C. Hawksley, the Engineers to the Company, have been erected. These engines are of 40-horse power each, and both are provided with a filter water pump and also a river water pump, capable of raising from the river 931,600 gallons each per day of twelve hours, and sending the same amount of filtered water daily into the service reservoir on Severus Hill for the supply of the city. The two engines combined are therefore able to send 1,863,200 gallons of pure water per day for the use of the citizens, and this amount could, in case of necessity, be increased to 2,000,000 gallons per diem. In addition to the new engines, the old ones at present used for the water supply will still be employed. In a short time they, together with the boilers, will be thoroughly repaired and placed in first-class working order, when the Company will be enabled, for many years to come, to meet every possible emergency that may arise in furnishing an abundant supply of water. In the new boiler-house four boilers have been erected constructed upon the most recent and improved principles.

It is worthy of remark that a new and powerful stand-pipe has been fixed at the Severus Hill reservoir, the advantage of which is that an additional pressure of water can be given to the extent of 40 feet in height. This will be most important in the case of a large fire breaking out in any part of the city. The Company have two subsiding reservoirs, four filtering-beds, and one service reservoir at Severus Hill, from which there are now two trunk mains, each 15 inches in diameter, their capacity being far more than ample to meet all requirements.

In order to prevent possible contamination of the water, and to allay all fears in that respect, the Directors are now engaged in diverting the Acomb Beck, the mouth of which, instead of being higher up the river than the Company's intake, will be fixed considerably lower, so as to avoid any complaint as to the quality of the water. It ought to be remarked, however, that the Acomb Beck is only used for surface water. It is not available for house drainage, and it could never be discovered that it was

the cause of any pollution in the water. The carrying out of this work is, nevertheless, to be commended, and it must be generally approved by the citizens of York.

The official opening of the new works took place on the 1st inst., when Messrs. Hawksley invited the Directors and a party of ladies and gentlemen to be present. On the guests arriving at the works at Acomb Landing, they were received and conducted to the Directors room, where a cold collation had been provided, after which Mr. T. Hawksley proposed "Prosperity to the York Water-Works," and Mr. J. F. Taylor, Chairman of the Directors, having briefly responded, the party proceeded to the new works.

Having been conducted through the works, the party were arranged in front of the engines, and Mr. Hawksley invited Mr. J. F. Taylor (Chairman) to start No. 1 engine, and Mr. J. L. Foster (Deputy-Chairman) to start No. 2 engine. Mr. Taylor said it afforded him great pleasure and satisfaction to witness the completion of these works, which had been executed with so much credit to the Engineers and to all parties concerned. In starting No. 1 engine he trusted it would long run to the benefit of the Shareholders of the Company and the advantage of the city. Mr. Foster said he also had pleasure in taking charge of No. 2 engine, and in giving it its first start. The two gentlemen then proceeded to put the engines in motion, which was done amidst enthusiastic cheers. A further survey of the works was then made, after which the party proceeded up to the Severus Hill, to witness the delivery of water through the new standpipe into the reservoir, which was found to work admirably.

In the evening Messrs. Hawksley entertained the Mayor of York, the City Sheriff, the Directors of the Company, and a number of other gentlemen, at dinner at the Station Hotel.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

(*Continued from page* 223.)

Mr. D. B. Esplin (Forfar) read a paper entitled

SOME REASONS FOR GAS COMPANIES AND CORPORATIONS LETTING OUT METERS TO CONSUMERS FREE OF CHARGE.

To the majority of the members present, the subject I have chosen must at first sight appear difficult, and I confess it has an air of a Quixotic exploit to assail an almost universal practice of gas companies, as charging rent of meters is. Several circumstances have induced me to give this matter some attention, and I hope the reasons which I shall adduce will have at least the merit of plausibility, and may also have the merit of originality, simply because what everybody has recognized as inevitable has not received from any one that due attention which it otherwise might have received.

The first feature that is prominent in the charge for rent of meters is the want of uniformity which characterizes the rates adopted by the different gas companies. This varies from an annual charge which covers in three or four years the cost of a new meter, down to a few instances where the principle I contend for has already been brought into practice—viz., no charge for meter-rent. So far as I can understand, the cost of purchasing and maintaining meters should be the same all over the country, and if there is to be a charge made, it is but fair that something like uniformity should be observed; but this would, in my opinion, be but a step in the direction which I consider is the right one—viz., the complete abolition of the charge.

I will now proceed to give some reasons for this change.

First Reason.—It would be to the mutual advantage of both gas seller and gas purchaser.

The purpose of a meter is to give an accurate record of the quantity of gas used. This is of mutual advantage—to the seller, as it secures payment for all the commodity; to the buyer, as it protects him from excessive charges. In short, the gas-meter fills the exact position, in a commercial sense, that the scales on a grocer's or other retail dealer's counter do. In one feature this comparison does not hold good, and in this instance to the disadvantage of the meter. About the most troublesome duty of a gas company in their intercourse with their customers is the estimation of accounts in the frequent case of "stopped" meters, and where this arises it seems unfair to charge the consumer rent on an article which has failed to perform its work. Generally speaking, the public have only an indifferent faith in the accuracy of a meter, and this want of confidence is intensified when it stops altogether, as this fact presents to their minds the alternative phase of inaccuracy and of going too fast. No explanation, however explicit, succeeds in entirely removing this impression. It cannot be doubted that the quarterly item, "Rent of meter," appearing in their accounts serves to keep up the antagonistic feeling. I am convinced that were this charge to disappear from accounts, it being merged into a charge for gas consumed, the suspicion of inaccuracy would be very much, if not entirely allayed. To follow out the comparison with the retail dealer's weights and scales, a purchaser would demur to the payment of, say, an additional penny per pound charged on any article, for weighing it.

Having in as few sentences as possible shown the impolicy of charging meter-rent from a commercial point of view, I pass on to some other reasons.

Second Reason.—Its abolition would establish a much better basis by which to compare the relative revenue accounts of gas companies, especially as regards the charge for gas.

It is obvious that in the case of two companies, one of which derives a seventh part of its revenue from meter-rents, and the other only about a twentieth part, the former can sell gas nominally much cheaper than the latter, recouping the difference by its high tariff for rent of meters. But the consumer does not get a comparatively cheaper article—in fact, the charge to consumers is much more unequal where a low price is charged for the gas, as there is seldom any variation in the charge for meter-rent, notwithstanding the great fluctuations in the cost of meters, as well as other articles. The majority of gas companies charge as much rent on their meters now, when the net cost is at a minimum, as they did 30 years ago, when meters cost double. The only benefit accruing from the present low price is that the capital account item, "New meters," may be less than formerly. The small consumer does not get a full share of the benefits of a reduced price for gas, as his account is always weighted with that unaltering entry, "Meter-rent, 2s. per quarter," when perhaps his gas account proper is, say, only 6s.

Our gas accounts show this inequality of charge in a marked degree. I find on investigation that were the revenue at present derived from meter-rental commuted into the gross charge for gas, out of 3000 consumers, the gas accounts of 2500 of them would be less per annum than at present. In short, this meter-rental permits considerable vagaries in gas companies transactions, and when a poor gas manager is badgered about his dear gas compared with that of some neighbouring towns, he can point in many cases to the reason. The money has been put into the gas consumer's pocket in the shape of cheap gas, but just taken out again in the shape of a high annual rent for the meter.

The following letter, bearing upon this question, appeared in the Journal of Gas Lighting for Sept. 17 last year:—

"Sir,—At the present time my neighbours are selling gas at a lower rate than myself, and the cause appears partly to be that they charge a high rate for the rent of meters. I realize not more than £106 per annum from about 1300 meters, whereas, if I charged the same rate per meter as my neighbours, I should realize from £350 to £500. This explanation is not sufficient for the consumers, and I therefore wish to inquire of my fellow-managers what are their views on this question. Which is the better policy, to charge a high meter-rent and a lower price for gas, or make no charge for meter-rent and charge a higher price for gas?—B. C."

Which of the following sample gas accounts is the less?—

4000 cubic feet of gas, at 4s. per 1000	£0	16	0
One year's rent of meter	0	6	0
Total	£1	2	0

Or,

4000 cubic feet of gas, at 5s. per 1000	£1	0	0
One year's rent of meter	0	1	6
Total	£1	1	6

No. 2 gas company is charging 1s. more per 1000 for the gas, yet the consumer of this dear gas has less to pay altogether than the consumer of No. 1 company's commodity. This may be considered an extreme instance; but I can assure you it is founded on fact, and shows at a glance the great inequalities at present existing.

Third Reason.—The third reason I would adduce is the facility which the abolition of meter-rent would give to gas companies to place the right meter in the right place; that is to say, a meter fixed in proportion to the consumption.

I presume the majority of gas companies have a differential rate of charge for meter-rent, rising in proportion to the size of the meter. Where this is the rule, as it is in my works, it becomes the object of the gas consumer to get a meter for which he will have the minimum rent to pay. In the case of a house larger than that of the general class of working men's houses, this object comes in collision with the rule of the gas-works to fix a meter in proportion to the consumption.

Where this desire of the consumer to obtain as low-rented a meter as possible raises difficulties, was instanced in my experience under the following circumstances:—I instructed our meter inspector to ascertain how many lights were supplied from each meter in the town, and after this return was completed, in looking over it I found glaring anomalies existing—cases of a 3-light meter being fixed where there were 30 lights being supplied from it, and numerous houses, ranging from 20 to 10 lights, with 3-light meters. I resolved to adjust the meters to positions proportionate to their capacity, and whilst doing so I met with the difficulty of which I speak. Parties were quite willing to allow us to change their meters, until informed that when we put in a 10 or 20 light meter to replace the 3-light, as the case required, an additional charge would be made for the rent thereof, and then opposition to our procedure was at once raised, the plea advanced being that they were quite satisfied with the old meter, and would not consent to its removal. These difficulties occasioned us considerable trouble from the cause stated, which would not have presented themselves had the interests of the consumer not been affected in the shape of increased charge for meter-rent.

It is not necessary for me to enlarge upon the advantages of a proper adjustment of meters to the consumption. The experience of every gas manager proves the great loss to gas companies through what I may designate "overworked" meters, and I think it is a real misfortune if any movement in the direction of reducing this loss should clash with the interests of gas consumers. Meters proportionate in size to the requirements of a house, prevent the too frequent complaints of want of supply and total extinction of lights at a time when an unfailing supply is most needed; and were meters let out free of charge, the gas consumer would have no interest in opposing any step taken by the gas officials to secure for their company accuracy in the measurement of the gas used.

I will now put in a plea on the broader basis in the economics of gas supply. Gas companies, and pre-eminently corporations, are granted a monopoly of the supply of the commodity they manufacture. This great privilege is granted by the State under the condition that it will be brought within the reach of all as one of the necessities of civilized life. It has been claimed for gas, as an illuminant, that it is the cleanest, cheapest, and best, in a sanitary point of view, of all artificial means of lighting which have yet come into general use. It becomes the duty of those who dispense this article to raise no barriers to its universal adoption, but bring it within the reach of the very poorest; in fact, I hold that special inducements should be given to the great mass of dwellers in towns to use gas freely. Light is a grand dispeller of many of the ills that the poorer classes are heir to. I ask, "Have these inducements been held forth?" and I fear the answer must yet be, "Very imperfectly."

We, in Scotland, witness a very general use of gas around us, and I unhesitatingly say that not the least cause of this is the low tariff for rent of meters. When you go across the Tweed, gas is not nearly so much in general request. It is too frequently the case that artificial barriers, in the shape of charges for services and rents of meters, are raised; and fittings not being supplied to the inferior class of houses by their proprietors, tenants have either to purchase them or, as in many cases, get them on hire from the gas company. But much has yet to be done, both here and elsewhere, in bringing the use of gas within the reach of the poorest classes. In my opinion, nothing would tend to develop the use of gas among the poorer classes more than the abolition of the charge for meter-rent. The requirements of gas among this class would, of course, be a minimum, and it is here where the meter-rent presses most heavily. Say that the average annual consumption was about 2000 to 3000 cubic feet, at, say, 5s. or 6s. per 1000 = 10s., 12s., 15s., or 18s., by adding to this only 2s. per annum for rent of meter, you at once increase the accounts by 17 per cent. and 11 per cent. respectively. Of course, commuting the charge into gas-rental will not remove it altogether, but the charge is equalized, and in the case of the poorer class of consumers the net charge is lessened. And on the part of officials I am disposed to think that were the revenue collected on gas alone, greater care would be exercised to secure an account for all the gas delivered, and the heavy item of "Unaccounted-for gas" would be lessened in many works where at present the revenue for gas is supplemented by the rental for meters, and makes up the deficiency arising from leakage, &c.

Discussion.

Mr. Hislop (Paisley): I have listened with great interest to the paper Mr. Esplin has submitted to us, and certainly it touches on subjects with respect to which you will find many who agree and many who disagree. I should be inclined to go as far as Mr. Esplin, and make the charge for meters only sufficient to cover repairs. I would not be inclined in any case to abolish them altogether. It is a fact that in many cases where the hire for the meter has been abandoned, the consumers have very speedily overlooked the fact that a benefit has been conferred upon them, and have

regarded the abolition of the hire as a thing to which they were entitled. That is the reason why I would insist on a rent of, say, 1s. or 1s. 6d. a year. In Paisley the rent is 1s. 6d. for 3-light meters, and that is allowed to be sufficient to overtake the repair of these meters. By constant attention to the meters greater accuracy of registration is secured, and proper payment received for the gas supplied to the consumer. No doubt there is a good deal of force in the arguments of Mr. Esplin, as urged on behalf of the consumers who object to their meters being changed. I have found that in my own case, if it is discovered that the meter used by a large consumer of gas is too small for the consumption, I, in common with Mr. Esplin, have found great difficulty in getting the consumer to give up the old meter, and substitute for it one of sufficient capacity.

Mr. HISLOP (Uddingston): By the proposed arrangement the smaller consumer would get the benefit at the expense of the large consumer. If you take a consumer of 12,000 cubic feet and another of 3000 cubic feet from the same size of meter, and charge 1s. 6d. meter-rent, the large consumer has his meter for 1¼d. per 1000, while the smaller consumer pays 6d. per 1000. Putting the two together, you have a rent of something like 1d. per 1000. It is more difficult for gas companies than for almost every other trading concern to apply an equitable method, as they require to measure out the gas for each of their customers.

Mr. MITCHELL (Coatbridge): It is by every gentleman present stating the manner in which the business of his company is conducted that we arrive at a proper issue on the question under discussion. Mr. Esplin has spoken of the failure of the meters to register. That is of very rare occurrence now-a-days, when we have meter makers in the field, especially those in Edinburgh, who have devoted so much time and talent to the perfection of the instrument. With reference to the argument that the retail dealer does not charge anything for his scales, I have to say that we do not charge anything for the station-meter, which stands in the same relation to the company that the scales hold to the consumer. Then in regard to the charge of £160 for 1300 meters, I have to say that at Coatbridge we have over 2300 meters, and the meter-rent is £340. That bears about the same proportion as the figures brought out by Mr. Esplin. For meters of two or three lights we charge 3s., and for meters of larger size we charge 10 per cent. of their cost. I really do not know how the public can expect to have the use of meters gratis. We have £5000 sunk in meters in Coatbridge. I cannot agree with Mr. Esplin upon the abolition of the rents for meters.

Mr. M'GILCHRIST: It is always pleasant, in a discussion on a paper, to be able to compliment the writer. On this occasion I agree with Mr. Esplin, and I endorse every word he has said on the subject of his communication. Mr. Mitchell has raised the question who is to pay interest upon the £5000 spent on meters at Coatbridge. The answer is not far to seek. The price of gas ought to pay for it, because you have an equal right to charge the consumer for the station-meter, or the retorts, or the service-pipes, as the meters. The meter is a mutual benefit, and we could not conduct our business without it. It is part of our plant, and it should be upheld as part of the works, and I have no doubt, in the future, it will be considered part of the plant of companies and corporations, and they will give meters free of charge. In Dumbarton we charge 1s. a year for our meters. We do not supply dry meters. A number of our consumers purchase them, thinking that they get their gas cheaper with the dry meter than with the wet. They think the dry meter registers less than the wet meter. I have proposed to the Convener of my Committee to abolish meter-rents altogether at the next balance, as I consider such rent an unjust charge; but this will be fully brought out in my paper.

Mr. ROBB (Haddington): I am glad to hear that so many in the meeting are of my opinion. For thirty years I have advocated the abolition of meter-rents. We might as well charge the consumer for the proportion of the cost of the pipes. Another thing I have a personal objection to is the inequality of the meter-rents. One-third of the consumers in Haddington, for instance, do not burn 100 feet of gas in, say, three of the summer months, and yet the collector is sent round to get 8d. for the gas and 2s. for the meter-rent. Our Directors are almost all favourable to the abolition of the meter-rents, but they feel there is a little difficulty. Some people have their own meters, and the Directors say we should have to take back these meters, which are old. That may be a difficulty, but I think most companies will be able to stand the strain on their resources. I am glad that Mr. M'Gilchrist, who, I know, is always so thoroughly forward in every good work, coincides with us. I trust the question will not be allowed to lie in abeyance, for it is an unjust thing to charge our consumers for a meter which is used for the purposes of the Company. And then, as to the capital, why nine-tenths of it is paid out of profits. I see a good many balance-sheets, and I never yet saw in them any charge for meters. They are paid out of profits, and I think the consumers are entitled to get the benefit of their abolition.

Mr. CLAZY (Kelso): Are you a shareholder?

Mr. ROBB: No. Our charge for meters is £42 a year, and what is that? We could lay it aside, and it would never affect our dividends. All our meters are paid for out of profits, as in other companies.

Mr. MACPHERSON: It appears to me that the whole of this matter can be put in a nutshell. Here are two consumers, say, the one burning 3000 feet of gas, and the other 6000. We have to expend the same amount of capital in the one case as in the other, and it is quite unreasonable to say that we should put a disproportionate burden on the larger consumer, in the shape of meter-rent. With regard to the charges for meters, if the accounts are properly made up, there will be a certain proportion of the money expended on meters added to capital.

Mr. ROBB: Not in my experience.

Mr. M'GILLIVRAY: I think there are two sides to every question, and there is another phase of the present question which I have hardly heard mooted yet, and it applies to consumers in general, who in small towns, if they knew that there was no charge for the meter, would be inclined to order one to be fixed, whereas if there was a rent to pay, they would be a little more cautious; and by the abolition of the rents for them the companies capital would be increased. In the Company with which I am connected, we make a standing order that if a consumer wants a meter, he pays a rent, and if a landlord orders a meter for a house in which there is no tenant, he has to pay a rent for it, and in this way we keep the expenditure for new meters very low.

Mr. PEEBLES: Mr. M'Gilchrist has pretty well shelved the question; but the debate has recalled to my recollection the character in one of Sam Slick's novels, who went about the country selling clocks. He got wives, unknown to their husbands, to put up one of his clocks, and he left it there for a considerable time, and then he would come back and want to take it away; but invariably the old wife would say, "Oh, no; we will pay for the clock." In the same way send a good meter into the house, and get the people to use the gas, and know its advantages and benefits, and, in imitation of the American wives, they will not let the meter go.

Mr. MACPHERSON: Do you consider that justice? It is justice Mr. Esplin is contending for, and not policy. I agree with the policy. I consider it most unjust to put a meter costing the same amount into, say, two houses, the one consuming 12,000 cubic feet, and the other only 1000, and yet charge both the same rent.

Mr. M'GILCHRIST: If the meter is not charged by rental, it must be charged for in the gas, which I think is the proper way.

The PRESIDENT: I am very much of Mr. Hislop's opinion, that we should only charge meter-rents to the extent of enabling us to keep the meter in a proper state of repair. That is really the true data to go by.

Mr. HALL (St. Andrew's): There is one Company who have the honour of supplying the cheapest gas in Scotland, and who do not provide any meters.

Mr. ESPLIN: It is a sufficient evidence of the expediency of my paper that it has divided the opinion of the members, and I am satisfied with that; but I think that some of the gentlemen have lost sight of—first, the commercial view of the question; and, secondly, its social view. What I strongly insist upon is that you should be able to put gas within the reach of all—within the reach of the poorer classes of the community; and I hold that this meter-rental is a barrier to the poorer classes of residents in a town using gas. There is no rental charged for paraffin lamps and candles. In these cases they are paid for, and the advantage is obtained. I am quite satisfied that the meter-rent will soon be a thing of the past.

Mr. J. M'GILCHRIST read a paper on

CIRCUMSTANCES AFFECTING THE PRICE OF GAS.

The circumstances affecting the price of gas are so numerous and various that it will be impossible for me, in a short paper, to enumerate many of them. However, I trust the discussion my remarks will provoke will supplement any omissions on my part.

Since the first quarter of this century, when our ingenious countryman's discovery—"The Application of Coal Gas to Useful Purposes"—was gaining public favour, there have been many changes in the circumstances affecting the price of gas. Those, I am glad to say, have generally tended to improve the purity and quality, and reduce the price to such an extent that in the present year coal gas is almost universally supplied at a lower average price than it has ever been sold at. I may be permitted to remark, in passing, that gaslight has been found, after a severe tussle with its bright and glittering rival, to be for general purposes not only the cheapest, but the most convenient artificial light ever yet discovered. How long it will occupy this foremost position time only can tell.

Although, comparatively with times that are not long past, the price of gas is now greatly reduced, I must confess that the price charged for gas is the argument most strongly used against it. Whenever its position is attacked, on the rival's banner you will invariably behold in brilliant letters, "Half the Price of Gas." It should be our endeavour, by combined action, to fortify the point of attack; and our most effective fortification will be the perfecting of our apparatus, so as to ensure an entire absence of waste. The fortification will never be completed until we can, in every-day work in the retort-house, extract from our raw material the same amount of gas, &c., as is obtained by the analyst in his laboratory.

I will now refer to a few existing, but, as I think, unnecessary circumstances which tend to increase the price of gas. There is no district, with perhaps the solitary exception of London, so large that it could not have a cheaper supply of gas from one well-regulated corporation than it could possibly have from any number of competing companies. The business of gas manufacture cannot very well be compared to any other commercial enterprise, because, should the works in a district multiply, the result must inevitably be that the consumer must pay sooner or later for the unnecessary duplication of works, mains, &c. To give a case in point, allow me to refer to the position of the city in which we are met, with respect to its gas supply. Here we have two Companies, if not actively, at least contending for the supply of the inhabitants with gas, and it is strange indeed that the Directors and Shareholders of these Companies do not benefit by the lessons and experiences of the past, and come to the wise resolution of amalgamating, and in this way give their consumers cheaper gas than at present, and this, too, without in the slightest degree decreasing the dividend they have hitherto received. I say it is strange that the two Companies do not unite, but it appears to me stranger still that the Corporation of a city famous for its learning do not acquire the undertakings of the two Companies, and thereby secure gas not only for public lighting, but for their constituents, whose interests it is ever their duty to consult. In the presence of so many gas managers, it is not necessary that I should refer in detail to all the drawbacks attendant upon competition in a city; but I may, in a word, say that with two such Companies there must ever be an unnecessary excavation of public and private streets, and, owing to the doubling of main and service pipes, increased leakage, which is generally felt for long years after companies amalgamate. Then there is the double expense of management. As necessary consequences, these items all come to be charged upon the price of the manufactured article, and therefore paid by the consumer. Another reason in favour of the acquisition of gas-works by corporations is that they can make extensions at from 4 to 4½ per cent.—a very material consideration in these days, when gas-works are extending so rapidly. Altogether, I am of opinion that managers can manufacture gas more economically under a corporation than under a company, for companies being trading concerns, they naturally pay a much higher rate on the money invested. Indeed, I should not be astonished to see at an early day an Act passed compelling corporations to acquire the gas-works in their districts, the circumstances affecting the price of gas being, in so many cases, so favourable to corporation management.

The cost of labour, carriage of coal, the nature of soil for preserving or destroying main and service pipes, the condition and situation of the works, the wisdom and ability of those who have formerly had charge of the concerns, are all circumstances affecting the price of gas; but all of these I do not specially consider when making comparisons of the selling prices of gas later on in my paper. I wish to bring out the fact that gas corporations or companies who sell gas at the cheapest rates, do not manufacture it at a lower price than other corporations or companies charging or selling their gas at higher rates. I know a gas company, with a make of about 20 million feet, who require upwards of 2s. per 1000 feet sold to pay their dividend, and another company with a much larger make who require a fraction over 9d. to pay their dividend. Now, supposing that the two companies to which I refer were selling gas, of equal power, within 1s. per 1000 cubic feet of each other's prices, and were paying their dividends regularly, the manager with the smaller capital would be recognized as a sharp, pushing fellow, and thoroughly up to his business, while the other, actually working more economically, but being burdened with heavy capital, would perhaps be considered behind the times—not because he could not manufacture gas as economically as his brother manager, but simply because his company did not sell it at so cheap a price. The public, and too often gas directors and shareholders, are ignorant of, and care nothing for the circumstances that affect the price of gas. All they consider is, what is the price per 1000 cubic feet they have to pay for it. Now, we gas managers ought to be able to produce gas and sell it at as cheap a rate as it is sold at in any district similarly situated to our own; and if we are unable to do that, we ought to know the reason why.

As is well known, the West of Scotland Association of Gas Managers, in their "Annual Report on the Gas Supply of Scotland," give valuable statistics, which I have often thought might be advantageously augmented

by the addition of a column containing the amount necessary to pay interest, or dividend, per 1000 cubic feet of gas sold. I consider the capital too high when it requires more than 1s. 3d. per 1000 cubic feet sold to pay interest or dividend, and very low when it requires less than 8d. to meet this demand. I am acquainted with two burghs (coast towns) manufacturing about the same quantity of gas, and selling it at about the same price, and in the one town it requires about 40 per cent. of the selling price of gas to pay the dividend, while in the other they have little or no capital to pay upon at all. The latter town, one would say, is exceptionally favourably situated for selling cheap gas. These facts show that the selling price of gas cannot indicate correctly the efficiency or otherwise of the management of gas-works. Before fair comparisons can be made of the management of one works with another, the favourable or unfavourable circumstances under which both exist ought to be known and taken into consideration. The amount required to pay interest or dividend is so very far from being uniform, that it will prevent the selling price of gas from ever becoming a correct test of efficient management.

Of late we have seen, in the journals connected with our industry, a northern and a southern burgh claiming the high honour of supplying the cheapest gas in Scotland. I do not intend to discuss here the question of whether the Corporation or the Company sell the cheapest gas. Both undoubtedly occupy positions in the forefront of gas undertakings, and both have not been backward in telling the world of their success. On this account, therefore, I take the liberty of comparing the circumstances that enable them to sell gas at a cheap rate, with those affecting other undertakings selling gas at a higher rate.

It is unfortunate, in one sense, that Parliament has granted power to corporations to subsidize burgh or police rates out of profits accruing from the sale of gas—for this reason, that the consumer, instead of getting a reduction in the price of gas, as in other circumstances would be the case, pays a higher price for his gas and grumbles thereat, forgetful all the while, or perhaps ignorant of the fact, that the profits, which would in other circumstances go to reduce the price of gas, in his instance go to reduce rates for which he is liable. In Dundee they wisely use all the gas profits to reduce the price of gas. In this respect, therefore, Greenock labours under a disadvantage, for they give £4000 of their gas profits annually to subsidize the police-rates. This sum represents 7d. per 1000 cubic feet sold. Then again the Dundee Commissioners charge 1s. 6d. per annum for No. 1 meters, and other sizes in proportion, over and above the price of gas. The Greenock Corporation think the price of gas should include the cost of the meters, as well as any other part of their distributing plant, and in this I think they are right. The cost, per 1000 cubic feet sold, for repairs, depreciation, and interest on capital expended on meters is 4d. per 1000 cubic feet sold in Glasgow, and this sum I take to be a fair estimate for Greenock. Therefore, adding the 7d. and the 4d. together, and deducting the resultant from the selling price of gas in Greenock last year, I find that 3s. 8d. is the actual price the ratepayers paid for their gas—a price actually cheaper than that charged in Dundee, apart altogether from the average illuminating power supplied by each—Greenock, 29; Dundee, 26 standard candles. It must be further borne in mind that the Dundee Commissioners charge a few millions of gas consumed beyond their municipal boundary at 1s. per 1000 cubic feet higher than in town. Now, I do not wish to be misunderstood here. I do not say that the Dundee undertaking is better managed than the Greenock, or the Greenock undertaking better than the Dundee; both have circumstances peculiar to themselves. What I wish to make apparent is, that if the Authorities of Greenock were to adopt the same policy as the Commissioners of Dundee with regard to rates and meter-rents, the gas world and the general public would credit the able Engineer of the Greenock works with the ability he displays in the management of his works. It is a notorious fact, that the outside world know comparatively nothing of the circumstances that affect the price of gas. All they appear to know is that gas was sold in Dundee last year at 3s. 11d. per 1000 cubic feet, with 5 per cent. off for prompt payment, and that the price in Greenock was 4s. 7d. per 1000 cubic feet.

With regard to the southern burgh, I may state that in my opinion there are few, if any, gas-works in Scotland better arranged for economical working. They reflect credit on the designer, Mr. Alexander Scott—the present able and energetic Manager of the works. In Galashiels the works and principal mains are nearly new, and in some other respects the Company are more favourably situated for the cheap manufacture of gas than many other companies in Scotland. For instance, they have a number of large mills in the locality, which consume about 40 per cent. of the entire make, some of which consume regularly through all the hours of darkness. Their capital account is light, and it only requires a fraction over 9d. per 1000 cubic feet sold to pay their dividend. Unlike many other companies and corporations, they do not supply either service-pipes or meters; these are all paid for by the proprietors or consumers. The Galashiels Gas Company, I may state, compel all consumers to put in service-pipes of lead (water weights), and this may be an important factor in keeping down their leakage, which is lower than in almost any town in Scotland. Now, if the Galashiels Company were, in the price of gas, to charge for repairs, depreciation, and interest on capital expended on service-pipes and meters, their charge would have been last year considerably higher than that charged by the Glasgow Corporation, and the Partick, Hillhead, and Maryhill Gas Company, whose charges were 4s. per 1000 cubic feet, which included the charges for meters and service-pipes.

Principally through excellent management, the northern and the southern burghs are to have gas for the ensuing year at even a cheaper rate than the last; but I am afraid neither will be entitled to the coveted honour of supplying the cheapest gas in Scotland; for I have heard it stated on good authority that both a Company and a Corporation are about to reduce the price of their gas to a rate per 1000 cubic feet that, although it includes the cost of meters and service-pipes, will be within 3d. of the Galashiels rate, which does not include these charges. Again, I wish it to be distinctly understood that I do not consider the towns referred to to be equally favourably situated for the economical production of gas, and consequently no fair comparison can be made of the efficiency of the management. If they had occupied any secondary position in the gas world, I should not have brought them before this meeting. My purpose in bringing this paper before you has been served, if I have shown you "Circumstances Affecting the Price of Gas" over which the Manager has little or no control. I think that the conveners of both corporations and companies should make themselves acquainted with the circumstances affecting the price of gas in other towns besides their own, before they rashly claim a position they are not entitled to.

In conclusion, gentlemen, I may state—indeed, I have no hesitation in saying that the foregoing remarks will not be endorsed by every member present; but I am confident that all will agree with me in stating that this and kindred Associations are doing much useful work—a circumstance that has reduced in the past, and will continue in the future to reduce the cost of gas to the consumer.

Discussion.

The PRESIDENT: In discussing this question, we ought to know the precise facts, but I do think we should omit the names of towns.

Mr. MITCHELL (Dundee): As Mr. M'Gilchrist has referred to Greenock and Dundee, and as I happen to be connected with Dundee, I must ask him to explain how he brings the price of gas in Greenock down to 3s. 8d., and makes it cheaper than Dundee gas. While I make this request, I deprecate the holding up of one corporation or company in comparison with another, to the extent that is sometimes done. As Mr. M'Gilchrist has read a paper calculated to provoke such a discussion, he should consider the selling price of the gas per 1000 cubic feet, the interest on capital, and the interest on the price paid to the companies for the works, which in Dundee takes the shape of annuities. In Dundee, 1s. 1d. per 1000 cubic feet of the gas sold, as far as I can calculate, is the amount paid out in the shape of annuities to the Shareholders of the old Companies, and then we have interest on mortgages and borrowed money, which is practically the same as a dividend in a gas company. Since Mr. M'Gilchrist has opened the discussion, I would ask him to take this 1s. 1d. off the price of the Dundee gas, and that brings it down to 2s. 8d., if he wishes to make a comparison.

Mr. M'GILCHRIST: I should require to take 1s. 1d. off the Greenock rates also, for they have the same burdens to meet per 1000 cubic feet sold.

Mr. R. MITCHELL (Coatbridge): I am delighted with the paper which has been read by Mr. M'Gilchrist, as the facts which he has brought forward have revealed a state of affairs of which I have hitherto been ignorant, and I think I am safe in saying that many other Managers in Scotland are similarly placed to myself. Many a time I have been puzzled, on reading over balance-sheets as they appear in the public prints, to know how it was the companies were able to pay such big dividends; but when I learn that something like 9d. per 1000 feet of gas sold is all that is required in one case to pay the dividend, while in another more than 2s. is required, the difficulty is removed from my mind. I know that in my own case it takes 1s. 4d. per 1000 cubic feet sold to pay our usual dividend. I sympathize much with the gentleman who is at the head of the works referred to by Mr. M'Gilchrist, and in whose case such a large proportion of the realized profits are apportioned to reduce the police-rates of the town. This mode of disposing of the profits places that gentleman in a very peculiar position, because consumers cannot expect to get gas at the lowest price, and at the same time have their police-rates reduced by the profits accruing from the manufacture of gas. I consider that this is a most appropriate paper on a subject which cannot fail to arouse much attention amongst those more intimately associated with the making of gas.

Mr. A. SCOTT (Falkirk): I should like to ask Mr. M'Gilchrist whether he has the statements of the capital of companies and corporations to which he has referred.

Mr. M'GILCHRIST: Some exception has been taken to the paper which I have had the honour of reading to this Association, on the ground that it contains certain statements which have been construed into personalities. This construction I consider to be fallacious. I may state that there is nothing farther from my intention than to become personal in anything I lay before the Association; and in this particular case I have done nothing more than criticize certain statements connected with these towns which have already been published to the world, and, consequently, courting criticism. I should have been glad to have submitted the facts without mentioning names, had that been possible, but as the towns were already well enough known, there was neither reason nor policy in suppressing what had already been made public. I am glad that my paper has been so well received; at the same time, I am sorry that it has not provoked freer discussion, and I think, Mr. President, that the remarks which you made at the beginning of the discussion have had something to do with the reserve which has been exhibited. Of course, the members of the Association will understand that it was no part of my intention to object to the principles on which the works in Galashiels, Dundee, and Greenock are conducted. The respective executives are quite entitled to conduct their business in the way they think best; but when it comes to a question of who is producing the cheapest gas, it ought to be made known, especially to gas managers, what the surrounding circumstances are affecting the manufacture and distribution of gas, &c. In answer to Mr. Mitchell, I may say that the charges in Greenock—7d. for the public rates, and 4d. for the meters—are charges unknown in Dundee, and that the charges for interest on borrowed money, &c., are practically the same, so that in this latter respect Greenock and Dundee are similarly situated. If I were to deduct, as proposed by Mr. Mitchell, 1s. 1d. from the price in Dundee for interest on mortgages and borrowed money, then it is plain I must follow a like course in Greenock, with this addition, however, that I must strike off the 11d. of advantage which the consumers in Greenock obtain in the shape of reduction of rates.

Mr. WATSON: I thought the capital charges in Greenock were very light.

Mr. M'GILCHRIST: No.

Mr. WATSON: At one time they were very light.

Mr. M'GILCHRIST: That might have been, but my remarks have reference to the last financial year. Mr. Robert Mitchell's remarks were complimentary of my paper, and I may say I am quite at one with him. Then in regard to Mr. Andrew Scott's question, as to whether I have any information regarding the capitals of the works referred to, I need only say that I do not consider it necessary to explain the source of my information. It is enough that the statements have been derived from public papers and accounts, and if they are wrong, any one has, or may have the opportunity of putting me right. In regard to maintenance of meters, I may say I took 4d. per 1000 cubic feet sold—the sum actually required in Glasgow to pay depreciation, repairs, and interest on capital expended on meters—for Greenock, and I think I am not far off the mark in making this statement, as any one will be convinced by a comparison of Glasgow and Greenock.

Mr. MITCHELL (Dundee): I have only to explain that Mr. M'Gilchrist's remarks have placed the matter under discussion in another light to me. In my previous remarks I said that I understood the 4d. to represent the interest paid on the Greenock Corporation's outlay, and nothing else whatever was required to pay interest on capital, so the meeting will readily understand my reason for the remarks I made.

On the motion of the PRESIDENT, a hearty vote of thanks was accorded to Mr. M'Gilchrist, and the meeting adjourned.

SECOND DAY.—FRIDAY, JULY 11.

The business of the Association this morning was commenced by the discussion of a motion proposed by Mr. G. R. Hislop last year, and adjourned for further consideration.

The SECRETARY read the motion, as follows:—"That the Gas Companies and Gas Commissions represented in the Association be requested to contribute a small sum annually to form a fund to be called the General Chemical Research and Patents Investigation Fund, from which prizes may be offered for the best papers on important subjects."

The PRESIDENT: I may state that the Committee had the matter under consideration, and were unanimously of opinion that the appointment of such a Committee was desirable.

Mr. G. R. Hislop: Last year, when the matter was discussed, it seemed to be distasteful to some members that there should be any reference to patents in the motion. Now, if it is thought to be more in accordance with the views of the members, I have no objection to confine the motion to "Research and Reward Fund." For myself, I cannot see what harm would result in including the word "patents," inasmuch as it would be very desirable in many cases, with important patents, to investigate and ascertain their merits or demerits, and report the same to the Association. I may say a word in explanation of the view of the subject that I referred to last year—namely, that in the case of a Committee being appointed to investigate, the Committee should not confine themselves to their own judgment alone, but should be empowered to call in the highest professional skill, and, of course, the fees of such men would be paid out of this fund. If the subject was chemical, the best chemist would be asked to co-operate with the Committee; or in whatever department of science the subject to be considered lay, the most skilful gentlemen in that department would be called in to confer with the Committee. The scope and the application of the motion is wide, and it is for the meeting to say whether or not it will adopt such a motion. Last year the motion was carried by a majority of two, and it was then wisely suggested by the President that its further consideration should be deferred, and it was as well that it was so, as it gives the members now an opportunity of discussing the merits and demerits of the proposal.

Mr. Mitchell (Coatbridge): I think it is an important step we are taking in adopting this motion. Research has not hitherto been appreciated, or received that amount of encouragement which it deserved. In many cases patent apparatus has been brought out, which has not met with that amount of encouragement it deserved at the hands of the public. I exclude gas managers, because I think they are always willing to accept a benefit when it has been proved to them that benefit will result from the introduction of certain apparatus. If gas managers would only take up this matter, a stimulus would be given to those gentlemen who have a sufficient amount of ingenuity to devise improved methods of performing mechanical or scientific operations, and in this way we should materially assist in advancing the science we are so intimately associated with.

Mr. Robb (Haddington): I should like to know whether it would not be necessary to limit the Committee as to the amount it should be allowed to expend, because we all know that the fees of scientists are very heavy. Then we know that but for the expense, many of us would make experiments on a larger scale than at present, and in this respect, too, it might be necessary to tie the hands of the Committee a little. At the same time I heartily agree with the purpose of the motion. I think it is the duty of all who have an interest in the gas trade to support it. I beg to second the motion.

Mr. J. Thomson (Messrs. R. Laidlaw and Son, Glasgow): I think this is a wise step for the Association to take. I do not know, however, that I quite accept the whole scope of Mr. Hislop's motion. It is the first time I have heard of it; but in the Institution of Engineers and Shipbuilders in Scotland, of which I am a Vice-President, medals are given for the best papers, and it is an open question whether or not they are of benefit. The Council have had great difficulty in allocating the medals. It is felt to be a delicate duty sometimes, and, perhaps, before fully launching your scheme, you should consider that. Of course, it is always open to you, if you do not consider that the paper has any merit, to withhold the medal.

Mr. Young: I have very little to add to the remarks which have already been made. I may state, however, that Mr. Thomson slightly misunderstands the purpose in view, in consequence of not having heard the original discussion of this matter. The Association does not propose to make any award whatever; it is merely proposed to appoint a Committee from amongst the members who may possess the necessary skill to investigate any inventions that may be brought before them, and they will give a report upon these inventions for the benefit of the members of the Association. There have been a number of inventions which I believe have been allowed to pass into oblivion, simply from the fact that they had not been sufficiently examined by scientific men, and reported to the Association. Had this been done, these inventions would have received greater attention. I think Mr. Hislop's object in bringing this matter before the Association is to have these inventions investigated and reported upon.

Mr. Thomson: I think this is a laudable and desirable thing, apart from the medal.

Mr. Mackenzie: But the question of giving prizes is embraced in the motion.

Mr. Young: Since that is the case, I will move as an amendment that the part of the motion relating to prizes be deleted, because I think that would bring in an objectionable element. I did not observe that prizes formed any part of the motion.

Mr. Hislop: If it is acceptable to the meeting, I should propose to alter the motion, and change the words to "prize funds to meet expenses incurred in getting up papers." Many members, as has been hinted, have been deterred from entering into important experiments on account of the expense, and if it is agreeable to the meeting to put it in the form of expenses in connection with the production of papers and experiments, it is another aspect of the question. I do not think the Research Committee would object to a maximum sum being named, and that might be fairly done until the fund amounted to such an extent that one would be justified in leaving that matter in the hands of the Committee.

Mr. Mitchell (Dundee): I can scarcely support Mr. Hislop's motion in its altered form. It may be a reasonable thing for us as an Association to have a fund and a Committee for the purpose of making inquiry as to the facts accruing from important inventions connected with our manufacture. For instance, if a new purifying apparatus were brought under our attention, I should understand that this Committee, with these funds at their disposal, would be entitled to investigate as to the efficiency of the improvement; but I do not think it would be a wise thing for us to offer pecuniary assistance to those who might be anxious to take up some new ground, or to make experiments in any department with which we are connected. The establishment of the fund might have a tendency to induce gentlemen to enter into a multiplicity of experiments without bringing out practical results. If, however, any one does this with the effect of bringing out practical results, he will not fail to be appreciated.

Mr. Mitchell (Coatbridge): I think Mr. Mitchell has overlooked the point, which is the result.

The President: In order to save time, I think we should adopt Mr. Young's motion.

Mr. Young: I do not think it would be advisable for this Association to contribute to a fund for the purpose of investigating manufacturing apparatus with the view of advertising or recommending that form of apparatus to the Association. What I refer to is that the Committee should investigate and report to the Association respecting the value of apparatus, irrespective altogether of considerations of the outside world. Ultimately, no doubt, the outside world would get the report, and indirectly they would be benefited. I move in this direction for the reason that much improved apparatus has been neglected, from the fact that there never has been any investigation of it. My motion would be to this effect—"That a fund be created, which may be called the Inventions Investigation Fund, with the object of a Committee reporting upon any inventions which may be brought under the notice of the Association;" and that report could be a report to the Association, and solely for the benefit of its members.

Mr. Mitchell (Dundee): I second that motion.

Mr. M'Gilchrist: I have much pleasure in supporting the motion, as I may say that I seconded the motion at St. Andrew's last year. Since that meeting my opinions have not altered, and I have great pleasure in supporting Mr. Young's motion, which is in spirit that of Mr. Hislop. I have no doubt there is not a single company or corporation who will not willingly support such a fund. A great sum would not be required from each, and seeing that the electric light has stirred up gas companies and corporations within the past few months, I have no doubt they will all the more readily give their money for such a purpose.

Mr. Hislop had no objection to the altered form of the motion, and it was adopted.

On the motion of Mr. Donaldson (of Messrs. W. and B. Cowan, Edinburgh), seconded by Mr. G. R. Hislop, a Committee, consisting of the officials of the Association, was appointed to meet with a Committee of the West of Scotland Association of Gas Managers, with a view to the amalgamation of the two Associations.

The reading of papers was then resumed.

Mr. J. Thomson (Glasgow) read the following paper on

A GAS COMPRESSING AND CONDENSING APPARATUS.

The purpose of this paper is briefly to describe an apparatus which was constructed by my firm under the direction of Mr. Coleman, the patentee, and is described by him in his specification as "A machine for treating shale oil works gas for the production of volatile liquid hydrocarbons."

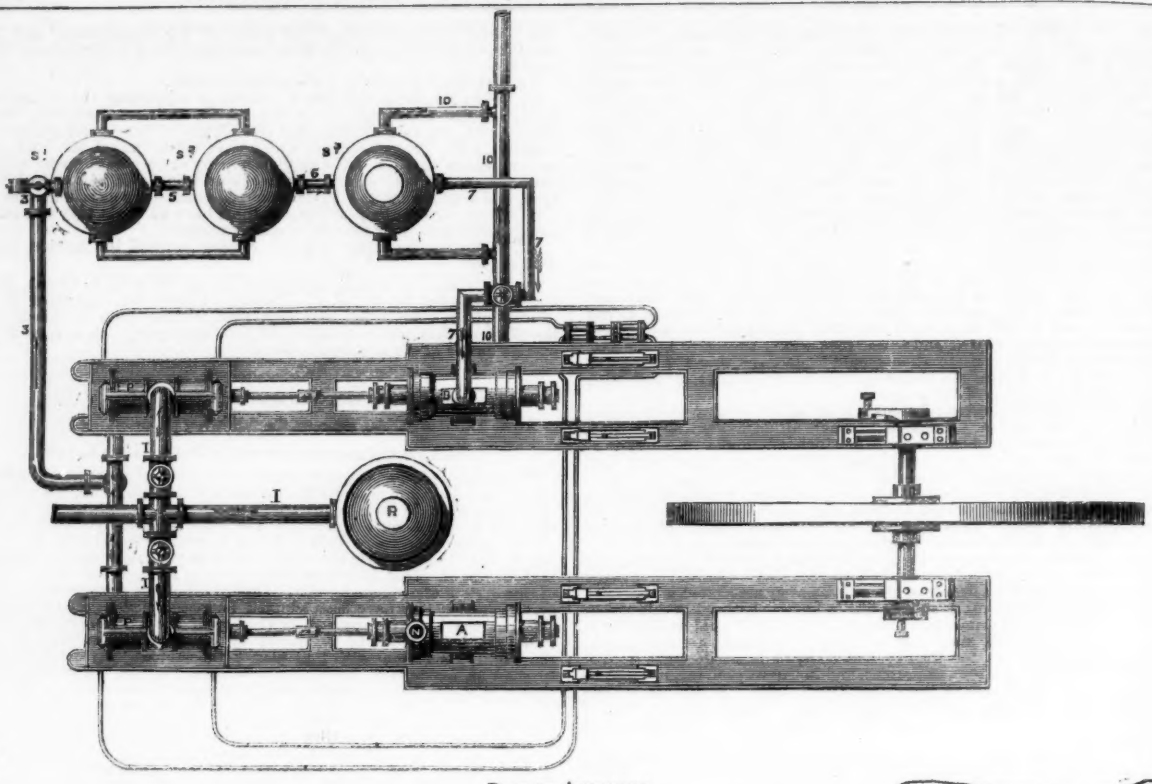
It is, perhaps, desirable that it should be well understood at the outset that it will not fall within the scope of this paper to discuss the questions that may be involved, from a scientific point of view, or the relative merits of this system of condensing volatile hydrocarbons as compared with other systems which may have been adopted for accomplishing a like object, as this has not been in any way in the line of my experience, and I must, therefore, leave it to be discussed by other gentlemen who may be thoroughly conversant with that part of the subject. My object is rather to show an example of the careful working out in practice of a scientific theory, and the near approximation to the theoretical results anticipated which was actually attained; and although this apparatus may not be in any way applicable to the purposes of an ordinary gas-works, I am not without hope that there may be some points that will interest the members of this Association, and may be the means of leading some to a line of thought that may produce useful results in another direction.

In a paper read before the Chemical Society of London in 1875, Mr. Coleman described the effects of pressure and cold upon the gaseous products of the distillation of carbonaceous shales, which remain permanent after all the condensable vapours are removed in the usual way by cooling to atmospheric temperature. These gases, whilst being permanent at 50 yield, under the influence of a pressure of about 10 atmospheres and a cold of zero Fahrenheit, large quantities of volatile liquid hydrocarbons, and he further states that his apparatus involves "First, the pumping of the gas by steam into a system of tubes capable of being externally cooled and from which the condensed liquids can be drawn off by ball-cocks or otherwise. Second, employing the compressed gas after being deprived of its liquids, for working a second engine coupled with, and parallel to the first, thus receiving a portion of the force originally employed in compression. Third, employing the expanded gas, after having had its temperature reduced in the act of doing the work of pumping, for supplying the necessary cold for cooling a portion of the condenser-pipes to zero."

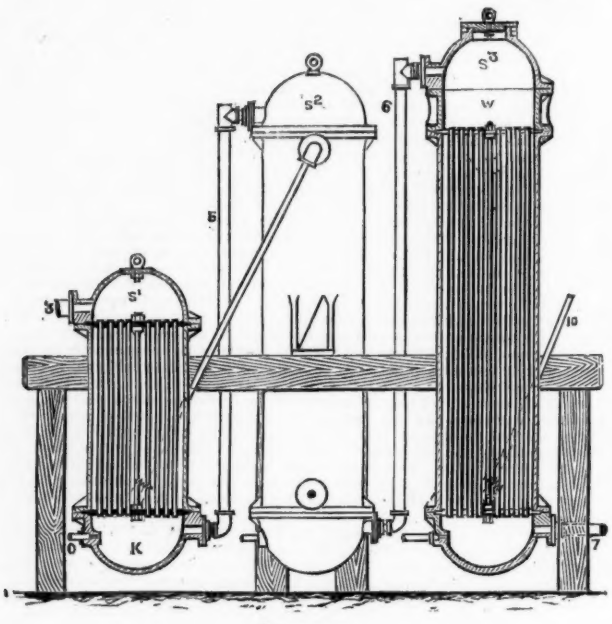
In proceeding to design and construct this machine, which, to a great extent, may be said to have been an experimental one, several important principles connected with the compression of air or gas, and their expansion, had to be kept well in view, and the usual practical difficulties as far as possible avoided; and it may be useful briefly to state here one or two leading points that thus presented themselves. It is well understood that when air or gas is compressed and expanded, or allowed to escape into the atmosphere, it becomes cooled; but it may not be so generally known although it has been practically demonstrated that no such cooling effect takes place when the compressed air is allowed to expand into a vacuum in which case no change whatever of temperature takes place. It is evident, therefore, that the reduced temperature which ensues when air is thus allowed to expand into the atmosphere, is caused by the work done in displacing the atmosphere; and it may be taken as proved that the greater the amount of work done, the greater will be the cold produced, so that the degrees of cold which could in this way be obtained will be very great, and will be limited only by practical or structural considerations.

It has been shown that compressed air made to do the work in an engine at an initial pressure of 10 atmospheres, and at a temperature of 62°, should become reduced to *minus* 190° Fahr. on being discharged, putting aside deduction for friction, &c. This shows the limitless production of cold by such a process; for let the initial pressure be higher—say, 20 or 30 atmospheres—and the cooling effect will correspondingly be produced. On the other hand, considerable difficulties are experienced in compressing air or gas to any considerable extent by the great heat produced, as it has been proved that a compression of 900 lbs. per square inch raises a gas to a temperature of 1200° Fahr. That is also produced by the friction of the gases escaping through the narrow orifices of the outlet-valves. And as, for every degree Fahrenheit, air or gas increases or decreases 1-490th in volume, it became most desirable to reduce as far as possible the resultant heat, and to make provision for so doing in proportioning the pumps of this apparatus. This machine is constructed to deal with 300,000 cubic feet of gas in the 24 hours, and this is pumped from the retorts at a temperature of from 50° to 60° Fahr., and had to be compressed in the gas-pumps to 10 atmospheres, or 150 lbs. on the square inch. The steam pressure in the boiler was given at 50 lbs., and the piston speed calculated at 250 feet per minute.

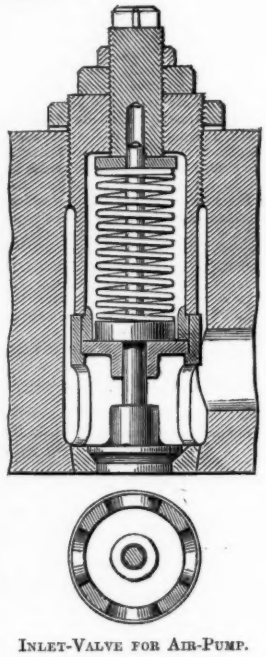
A reference to the accompanying drawings will explain the general arrangements of the apparatus. There are two ordinary horizontal engines fixed on strong bed-plates, and connected together by a crank-shaft which is common to both, and on which a fly-wheel weighing about seven tons is placed. The bed-plates are extended to carry the gas-compressing pumps, which are fixed inside cast-iron cisterns, and are thus surrounded by water. The engine marked A is the steam-engine, having a cylinder 16 inches diameter by 30 inch stroke, to which the steam is admitted by an ordinary slide-valve. The engine marked B, next the condensers, has a gas motive-power cylinder of the same diameter as the pumps—viz., 11 inches—and also a stroke of 30 inches. This cylinder is fitted with an ordinary slide-valve, as well as with variable expansion gear, to cut off at any part of the stroke that may be found desirable, and is driven by the compressed gas from which the liquids have been separated. The engines are controlled by a gas-regulating governor, R, placed between them, and attached to the throttle-valve by



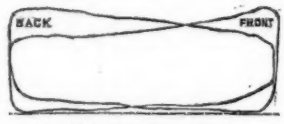
PLAN OF APPARATUS.



CONDENSERS.

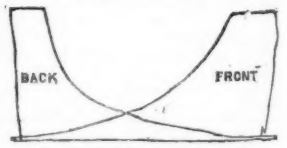


INLET-VALVE FOR AIR-PUMP.

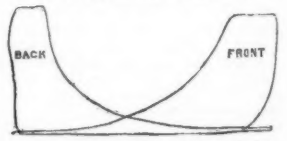


Steam Cylinder. Pressure, 53 lbs.; Revolutions, 48.

Gas Expansion Cylinder. Pressure reduced from 100 to 57 lbs.
Cut off at ¼ stroke. Revolutions, 48.



Pump opposite Steam Cylinder.



Pump opposite Gas Expansion Cylinder. Pressure on Pump, 100 lbs.; Steam Pressure, 53 lbs.; Revolutions, 48.

the usual arrangement of levers, and so adjusted as to prevent any undue suction on the shale retorts, by which atmospheric air might get mixed with the gas. So delicately is this governor adjusted as to cause these powerful engines to run from half speed to 80 revolutions by the variation of pressure of not more than a few tenths of an inch.

It will at this stage be desirable, before proceeding further with the details of the machines, to follow the course of the hydrocarbon gases in their progress through the apparatus. These gases, after giving up all their liquids by the ordinary arrangements, are pumped by the gas-pumps, P P, through the pipes, I I, and are compressed to from 8 to 10 atmospheres, or from 120 to 150 lbs. per square inch. They are then sent along the pipe 3 to the top of the first condenser, S^1, where they pass down the inside of the tubes, which are surrounded by cold water, into the reservoir, K, when they are found to be 70° Fahr., and where the condensed gas and rejected water are deposited, and from which they are drawn off by a ball-cock or other automatic arrangement. The compressed gas then passes on to the top of the next or middle condenser, S^2, by the pipe 5, and is exactly similar in construction to S^1, and is also surrounded by water, with like arrangements for drawing off the deposited liquids at the bottom. The gas is further carried forward by the pipe 6 to the top of S^3, or the third condenser, which is the same in construction as the others, but the tubes of which are not surrounded by water. It has, besides, fitted on the top a chamber filled with salt, so as to convert any suspended moisture into brine. The liquids deposited here are drawn off at the bottom as before described. The gas, still at the full initial pressure, but greatly reduced in volume, is carried from the condensers by the pipe 7 to the gas motive-power cylinder, from which, after doing its work, it is ejected and carried by the pipe 10 to circulate round the tubes of the thir dcondenser, S^3, at a temperature much below zero, after which it escapes into the pipes which convey it to the steam-boilers, where it is utilized by being burnt in the usual manner.

The surface condensers are, as will be seen by the drawings, strong heavy castings, and are each fitted with 200 1-inch wrought-iron tubes, giving a surface area of over 1200 square feet available for condensing purposes.

It was calculated that the gas, in its passage through the compressing pumps and condensers, would lose by condensation about 5 to 10 per cent. of its volume, and as its temperature would be reduced considerably below zero, it would also lose largely in volume from contraction—probably to the extent of a third—so that not more than half of the original volume of gas would be returned to the motive-power cylinder available for actual work, the initial pressure being kept up throughout, and the gas motive-power cylinder being made of the same diameter as the pumps—viz., 11 inches—the gas would have to be cut off at one-tenth of the stroke, and would be reduced to atmospheric pressure at its termination. This, I believe, is exactly what has occurred in actual work, as will be seen by reference to the beautiful indicator diagrams which have been taken from this cylinder. It was anticipated that considerable difficulty would be experienced in lubricating the cylinder, and in keeping the ports and passages free from ice; but this, I understand, has not been found to be the case, for although the outside of the cylinder, and the pipes leading from it, are all covered with a thick coating of ice, no difficulty has been found with the working of the cylinder internally, the nature of the hydrocarbons passing through it, either in a gaseous or partly liquid form, probably contributing to this.

The gas-compressing pumps are each placed in a cistern of cold water,

and are also provided with a set of small pumps, which are worked from the valve-gear of the engine, and which inject about 8 cubic inches of water at every stroke. The gas being compressed to 10 atmospheres naturally generates some hundreds of degrees of heat, which requires to be removed, and which is partly accomplished by the above means, as the gas-pumps are seldom found above blood heat. The clearance spaces at the ends of the stroke are not more than 3-16ths or 1-4th of an inch; and the inlet and outlet valves, being placed in the pump-covers, are in the direct path of the piston, and present very little resistance, so that the efficiency of these pumps has been found to be excellent.

The valves, of which there are four suction and three delivery in each pump-end cover, are peculiar in their construction, and were specially designed by the writer for this machine, and have been found to work satisfactorily. They are of wrought iron, 2½ inches in diameter, fitted with springs and suitably guided, and are completely self-contained, and each can be removed and replaced by another in a very few minutes. The excellent indicator diagrams obtained from these pumps show the efficiency of these valves, and the benefit of the injection of the cold water by the simple process referred to—viz., by the small pumps—and dispose of the necessity for more elaborate arrangements for accomplishing this object, so much insisted on by some makers of air or gas compressing machinery.

Having now so fully described the details of this machine, it will be interesting briefly to note some of the practical results obtained by this apparatus; and for the following facts I am indebted to Mr. Coleman's paper, read before the Institution of Engineers and Shipbuilders in Scotland, as I have not had an opportunity of testing the machine myself:—

"The engines were indicated, at the trial referred to, with steam at an initial pressure of 50 lbs., the pressure in the pumps being kept as nearly as possible at 100 lbs., and the piston speed 144 feet, or 48 revolutions. Under these circumstances, it was found that the

Motive cylinder A indicated	33	horse power
" " B "	7	"
Total driving power = . . .	40	"
The gas-pumps offered a resistance of .	32	"
Difference	8	"

The recovered power in 7-horse power seems comparatively small; but it must be taken into account that there is some loss of gas during progress through the machine, and also from the mobility of the gas at this pressure, and the difficulty of keeping it from escaping past the piston packing.

"Passing from mechanical details, the following summary of consecutive observations made over a period of 30 days may be stated:—

"Average temperature of the gas after being expanded and discharged from the motive-power cylinder B	30° Fahr. below zero.
"Average temperature of the compressed gas on its way to be expanded after leaving the surface condenser S^3	20° Fahr. above zero.
"Minimum temperature attained by the gas discharged from the motive cylinder B .	47° Fahr. below zero.

"Practical considerations made it undesirable to increase the working pressure above 135 lbs., but no doubt lower temperatures might have been obtained if the machine had been stretched to its utmost limits.

"The hydrocarbon liquids obtained by this process are those produced by pressure alone escaping from condenser S^1 at a temperature of 70° Fahr., and those produced in condenser S^3 escaping at temperatures approaching zero, the result of combined cold and pressure. The former have generally a specific gravity of ·710 at 60°, the latter about ·670 at 60°. The total produce of condensed hydrocarbons has been about 2000 gallons per week, which, when distilled, yield a considerable percentage of extremely volatile liquid hydrocarbons of specific gravities varying from ·640° to ·660°."

I can, of course, give no opinion as to the value of the results obtained for practical purposes, or as to its success from a commercial point of view. But it may be so far interesting to gas managers as indicating the possibility of getting a good supply of liquid hydrocarbons sufficiently volatile to be used for increasing the illuminating power of poor coal gas.

Discussion.

Mr. Young: This paper of Mr. Thomson's forms an excellent supplement to my remarks on the elimination of the sulphur compounds. It shows us that there is evidently a wide attention paid to the recovery of those very volatile hydrocarbons from the waste shale gases; and I have not the least doubt that in a very short period of time we shall see them extensively employed not only for the elimination of sulphur compounds, but also to carburet the gas. This arrangement, so kindly brought before us by Mr. Thomson, is most beautifully designed for the purposes which it is intended to accomplish. It is based upon the dynamic theory of heat, and takes advantage of the ascertained fact of that theory to reduce the molecular motion of the volatile hydrocarbons diffused through gas until they assume the liquid form. In the compressing cylinders the tension or molecular motion of the gases is lowered or partially overcome by the mechanical power expended upon the piston, and this loss of molecular motion, or the mechanical work done, is made sensible as heat, which is removed by the water surrounding the cylinders, and the water injected into the cooling arrangement. This brings about a condensation of the less volatile portion of the hydrocarbons, or those having a lower tension than the others. The compressed gases, after being cooled and a portion of the condensed fluid precipitated, are made to do mechanical work, or a portion of the remaining molecular motion is converted into mechanical motion, and the intense cold, or, in other words, the low molecular motion of the escaping gases, referred to by Mr. Thomson, is employed to cool or reduce the molecular motion of the gases under pressure, which brings about a further condensation of fluid hydrocarbons. In the compressing cylinders the loss of molecular motion is made sensible as heat, that heat being the exact equivalent of the mechanical motion expended in compressing the gas, and the cold, or loss of molecular motion resulting from the expanding gases, is the exact equivalent of the amount of mechanical motion imparted to the engine. Although this arrangement is founded upon sound principles, and most beautifully designed and constructed, it is, however, not, in my opinion, the most perfect or the best arrangement for removing the hydrocarbon fluid from waste shale gases. We all know that when we subject our crude gases to a very sudden condensation, although the condensable matters are reduced to the liquid form, yet they are in such a finely-divided state that they are not precipitated, but float forward through the whole arrangement of pipes, washers, and scrubbers, and find their way even into the purifiers. This arrangement for removing the fluids from the gases is open to that objection. The liquefaction of the volatile hydrocarbons is doubtless brought about, but it is accomplished so rapidly that they are not all precipitated, but a portion is carried forward as a fine spray, and passes away through the expanding cylinder in that form. Of course the injection of water will have the effect of entangling and carrying down a considerable portion of this fine spray; but a better plan, and one which I have already suggested, would be to inject dense or heavy oil, which would have the double effect of precipitating the spray, and absorbing the vapour of the more volatile fluids, which might have otherwise escaped condensation. Indeed, I am of opinion that the hydrocarbons can be far more economically and perfectly recovered from the waste shale gases by means of an absorbent oil, in the manner which I had the pleasure of describing to you some years ago, than by mechanical means. There can be no doubt that mechanical pressure and cold are the best means of reducing some of the most volatile substances from the vaporous or gaseous into the liquid state, but that is so only when the vapours of the substances are comparatively pure, and unmingled with others having far higher tensions. For instance, we might have air containing carbonic acid or water vapour. Now, we should never think of employing mechanical compression and cold to condense these substances from the air, because to bring about this condensation we should require not only to reduce the tension of the molecules of the carbonic acid and water vapour, but also to a corresponding degree reduce the tension of the air or gas with which they were mingled. What we should do, would be to employ hydrate of lime or some other chemical equivalent for the absorption of the carbonic acid, and for the water vapour we should employ some absorbent such as anhydrous lime-shells, chloride of calcium, or other substance having an affinity for water. In the same way, I have found it both more perfect and more economical to recover the hydrocarbons from waste shale gases by means of the absorbent action of dense or heavy oils. Mr. Thomson referred incidentally to the lack of interest which this machine must have to the members of this Association. I think, however, that he is wrong there, for although we cannot at present see how it may affect gas manufacture, yet no one can say what may be its influence in the future. We know, for instance, that the absorbent action of the heavy oils for the hydrocarbons in waste shale gases drew our attention to the desirability of keeping the tars, which have a similar absorbent effect, warm whilst in contact with the gas, in order to prevent the absorption of naphtha vapours, and that our gas was by this means enriched. Now this machine is intended to, and does remove the volatile hydrocarbons from the waste shale gases by compressing them. May not, therefore, an inversion of this machine be employed to bring about an extra diffusion of the hydrocarbon vapours through our gas by distending them during condensation, and thereby lead to an increased luminosity of the gas? I have often thought that there could be obtained from the cooling or rather shrinking of the gas during condensation, a motive power to produce the exhaustion of the gas from the retort, and its passage to the gasholder. We know that gas, from the time when it enters till it leaves the condensers, loses from 80° to 100° of temperature, and is reduced in volume to the extent of from 25 to 30 per cent., partly due to its shrinking, and partly to the removal of the condensable matters. Now, were we to admit the gas to the condensers through a cylinder such as is used to expand the gas in this arrangement, and employ an exhaust-pump for the transmission of the gas from the condensers to the scrubbers and purifiers, it is evident that, as we have from 25 to 30 per cent. less volume to pump out of the condensers than when it entered, we should, to all intents and purposes, have a low pressure or condensing engine, the motive power being the gas itself; and at the same time the gas being kept distended during condensation, there would result an action the reverse of that brought about by this machine, and an extra quantity of hydrocarbons would consequently be left diffused through the gas. I hope that I have been able to convey my meaning to Mr. Thomson, and that with his large mechanical abilities, and with the facilities at his disposal, he will be able to take up this matter, and present us, at some of our future meetings, with such an arrangement as shall have the double effect of enhancing the illuminating power by leaving an extra volume of the hydrocarbon vapours diffused through the gas, and at the same time, through the agency of the cooling or shrinking of the gas, supply the motive power necessary to exhaust the gas from the retorts, and pass it to the gasholders. I think there is due to Mr. Thomson a very hearty vote of thanks for bringing the subject before us.

The President: I agree with Mr. Young in asking you to give a hearty vote of thanks to Mr. Thomson. I am sure we have something excellent here, and perhaps before another meeting we shall have improvements.

Mr. Thomson: I have no remarks to make further than to thank you for your kind expressions, and to say with what pleasure I have listened to Mr. Young's remarks. Of course, I cannot speak on that part of the subject which he has taken up, but I knew he would treat it ably. It is the first time I have met Mr. Young, and I have experienced great satisfaction and profit in listening to him. That is a sufficient recompense for bringing this subject forward. The Association is much more indebted to his remarks than to me for bringing forward this paper. I think I followed him in the hint or suggestion which he made. It is a most ingenious idea, and well worth consideration, and I think it is worth endeavouring to see whether it cannot be practically worked out. There is no doubt a great deal in it, and I will certainly give some attention to the subject, and perhaps consult him further on the matter afterwards.

(To be continued.)

Electric Lighting in the Metropolis.—At the last meeting of the Metropolitan Board of Works, the following report of the Works and General Purposes Committee was, on a division, adopted by 14 to 9:—"As the Board are aware, an offer was recently received from the French Electrical Society to provide 20 additional lights on the Embankment, and it was proposed by the Board that 8 or 10 of these should be placed on Waterloo Bridge, and the remainder, if arrangements could be made with the Vestry of St. Martin's-in-the-Fields, along the Northumberland Avenue. From a communication which had since been received from the Vestry, it appears that they are not disposed to co-operate with the Board in the matter, on the ground of the extra expense of lighting which they consider would be thereby cast upon them, and your Committee would suggest, therefore, that some of these lights should be utilized at the Offices of the Board. Mr. Keates has communicated, by their direction, with the authorized agent of the French Society, and has received from him a statement that the Society will be willing to supply the lights at the rate already accepted for the lights on the Embankment and Waterloo Bridge—namely, 3d. per light per hour net. They ask, however, that the Board will furnish and lay down the wire in the subway and across the street, and will obtain the necessary consent from the Parochial Authority for opening the street. Your Committee are of opinion, after consulting Mr. Keates, that four lights should be placed in the Board-room, on standards erected in convenient positions, which Mr. Keates reports can be done at a comparatively trifling expense, and one light over the principal entrance to the building. Your Committee beg to recommend in accordance with the above views, and also that the consent of the Vestry of St. Martin's-in-the-Fields be asked to the opening of the street, for the purpose of laying the wires."

THE SOCIETY OF GERMAN GAS AND HYDRAULIC ENGINEERS.

The Annual Meeting of this Society was, we learn from a recent number of the *Journal für Gasbeleuchtung*, held at Bremen on the 18th, 19th, and 20th of June last. It was largely attended by members and guests from all parts of Germany, Austria, and Switzerland, and from the neighbouring kingdoms of the north, and passed off very satisfactorily. The chief part of the discussions was taken up, as usual during the past few years, by the subject of coke generative furnaces and the heating of retorts by gas, which is being rapidly developed. The Society may well be congratulated on the progress made, as this method of firing has been much advanced by the communications brought forward at former annual meetings, and without exaggeration it may be claimed that in this respect the gas industry of Germany is ahead of other countries.

First, the Commission which was appointed two years ago at the Leipzig meeting, composed of Messrs. Grahn, Schiele, and Dr. Schilling, reported on the experiments of Dr. Bünte as to the working of generator furnaces with different draughts. This inquiry, as stated in the report, was at first very limited in its scope, but gradually became enlarged and extended to include points of the greatest importance in working these furnaces, including also the admission of steam, first practically tried by Mr. Grahn. In their concluding report the Commission by no means consider those experiments as in any sense final, but, on the contrary, they propose to gain, by systematic experiments, a basis for the comparison of different constructions and systems of working.

The communications respecting other varieties of enterprise and experience in heating retorts were almost exclusively confined to exhibitions of the generators and settings constructed by Mr. Klönne, which are in use at the Bremen Gas-Works. The reports of these settings were very favourable, but we regret that the subject was not further illustrated, as on former occasions, by exhibits from other sources, in order that the element of competition might have been more evident.

The machines, by English engineers, for drawing and charging retorts, were again discussed. Mr. Grahn was able to communicate his own experience thereon, and showed two models of these machines. The simple and ingenious construction, and the accurate working of the models greatly interested the meeting. The practical value of these machines was demonstrated by the fact that Mr. Grahn had used them last winter for several settings of retorts at the gas-works of the cast steel works at Essen. Although the chief causes of the use of machines of this nature—strikes and high wages—are at present removed, the humane inducement to their adoption remains; that is, the transfer of the heaviest labour from workmen to machinery, and they, therefore, merit every success. This much-to-be-desired result is the more certain, as it is stated that the advantage lies with mechanical stoking in certain respects, which will doubtless be further improved when the settings shall be more generally altered and adapted to the machines.

Mr. Kohn, in his paper on the powerful burners intended to compete with the electric light, a large collection of which was shown, touched on one of the questions of the day. In Paris, London, and Havre, where the electric light is used, experiments with these large burners have been repeatedly made. Burners have been constructed by Sugg, Wigham, Giroud, the Paris Gas Company, and others, and further improvements in this line may be expected shortly. In these experimental burners, the early observations of Frankland, Heumann, and others, will be revived, according to which the light will be rendered more intense by the admission of hot air to the flame. The burners which are at present designed to carry out this idea, either by the use of double chimneys, as the Frankland, or by intermittent regeneration, as the Siemens, are to be considered as first experiments, the further development of which will be subject to careful attention.

Mr. Fähndrich read an interesting communication on the subject of increasing the illuminating power of gas by carburetting with naphthaline. It would indeed be a desirable thing if this prominent and erstwhile worthless substance could be utilized, but it seems there are still many obstacles to be overcome before this process can be relied on for general purposes.

Mr. Salzenberg raised the question which has been discussed at the meetings of the English Associations of Gas Engineers, of using gas as the standard of comparison for photometrical purposes, as proposed by Mr. Methven, by fixing a flame-zone of constant power. The Committee of the Society for the German Light Standard undertook to closely examine this subject, and to experiment on its practicability.

The efforts of the Society to establish uniformity and clearness in working statements and terminology were exemplified in the communications of Messrs. Grohmann and Salzenberg.

The papers and statements on the working of water-meters, by Messrs. Gill and Disselhoff, and Mr. Grahn's lecture on the influence of the material of filters on the composition of water, were rather remarkable. Dr. Lewin's experiments, conducted in Pettenkofer's laboratory, published in the *Zeitschrift für Biologie*, to which Mr. Grahn referred, have demonstrated that the chemical action of spongy iron, so generally believed to be effective, must be entirely denied, and that the noted Bischof filter, specially recommended by the Rivers Pollution Commissioners, is not more effective than a simple quartz filter. In consequence of these facts, Mr. Grahn recommended a central or peripherical filtration, especially with regard to Hamburg. The darkness yet prevailing respecting the influence of filtering material on the composition of water, which is of such importance from the point of view of hygiene, is not surprising when it is remembered that neither the quantity nor quality of ingredients which are supposed to be deleterious is reliably known. We are therefore pleased to learn that a report on this question will be published at the meeting of the Hygienic Society, to be held at Stuttgart in September next. Another interesting subject—that of public baths—will also be discussed by that Society.

A very good collection of gas and water meters, and similar articles of interest to gas and water engineers, as well as to consumers, was shown by various makers.

In spite of the unfavourable weather, the visit of the Society to Bremen was very agreeable. Visits were made to the gas and water works, and to the Weser shipbuilding yard. After the business of the meeting had been transacted, an excursion to Bremerhaven and Wilhelmshafen was made by the members, under the conduct of Messrs. Oechelhäuser and Fortmann, to whom the members and their friends were much indebted; and thus the meeting was brought to a satisfactory conclusion.

Wisbech Gas Company.—The annual meeting of the Wisbech Gaslight and Coke Company was held on Monday, the 28th ult., Mr. G. Dawbarn presiding. It was intended to have declared a dividend and transacted other business, but the Royal Assent having been given to the Company's Bill, the meeting was informal, and unable legally to proceed with the business. The Chairman stated that they had intended to recommend a dividend of 4s. per share, equal to 10 per cent. The old Company is now dissolved, and the new Company will bear the name of the Wisbech Lighting Company.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The coal trade throughout Lancashire is extremely dull, and the reductions in price which were made in the Manchester district at the commencement of the month, and which have been followed in one or two of the outside districts, seem only to have unsettled business without bringing forward any new orders. The pits generally are working less time, and at many of the collieries stocks of the better classes of round coal are being put down. For house-fire coals there is a very poor demand, and there are now but few inquiries in the market for gas-making coals, although one or two buyers are endeavouring to obtain tenders for deliveries over the next two or three years; but these are contracts which very few colliery proprietors care to entertain. Common round coals for steam and iron-making purposes are in very limited request, and the demand for engine fuel is also small, slack being still generally plentiful in the market, notwithstanding the limited production of this class of fuel. Prices are very variable, and there is so much competition for orders, that there is a continual cutting down going on in all directions, which renders it very difficult to say what are the present actual market values. The better classes of round coal for house-fire purposes can be bought readily at from 8s. to 8s. 6d. per ton, second qualities at from 6s. to 6s. 6d., common round coal at from 4s. 6d. to 5s. 3d., burgy at from 3s. 9d. to 4s. 3d., and good slack at from 2s. 6d. to 3s. 3d. per ton at the pit mouth.

The shipping trade is in a very unsatisfactory condition, and orders are competed for at extremely low prices; common coal, free on board at Liverpool and Garston, being offered at from 6s. 3d. to 6s. 6d. per ton.

In the iron trade there is no material change. The demand for both pig and manufactured iron continues of the most limited description, consumers only giving out orders for the smallest possible parcels as their immediate requirements compel them, and the whole sales put together represent but a very small weight in iron. Lancashire makers of pig iron are offering at about 43s. 6d. to 44s. per ton for No. 3 foundry, and about 43s. for No. 4 forge, less 2½ per cent. delivered into the Manchester district, and the price of bar iron is governed almost entirely by the nature of the specifications which buyers have to offer, manufacturers in many cases being willing to work without profit if they can only keep their forges going.

THE COAL AND GENERAL TRADES OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The shipments of best gas coals continue to be large to most parts of the world. There was a better coasting demand. Several small sailing vessels were also chartered to load gas coals to the smaller ports of the Baltic. Steamers, however, continue to supersede sailing ships in the gas trade. A contract was made last week for the supply of the Christiania Gas-Works with coals; but instead of being taken with sailing ships, it is arranged that the whole of the cargoes have to be conveyed by steamers. And so of other trades which have hitherto been exclusively supplied with gas coals by sailing tonnage. Steamers are taking their places. The importance to gas companies of this revolution in the carrying business of the world cannot be exaggerated, inasmuch as, with steamers, a failure in supply is impossible. Steamers can get out of the coal ports in almost any weather; their arrivals and sailings, too, may be calculated upon within four or five days at longest in the stormiest seasons of the year, and these are the periods when gas companies are usually in need of fresh supplies. In the olden times, sailing vessels were detained in port or in roadsteads for weeks through adverse winds or stormy weather.

The demand for best and medium qualities of gas coals continues. Medium sorts go off quieter, but the best collieries have the "pull" of the market. Prices remain practically unaltered. They are largely supplied with contracts until Christmas. The fitters state they do not take an order for a single cargo under 6s. 6d. per ton, less 2½ discount. But outside of those pits which have contracts running, and do not depend upon the open market for sales, it may be taken for granted that this rate is unattainable; 6s., less 2½ per cent., is nearer the mark. Inferior gas coals show a much lower quotation than that.

Excepting certain qualities of gas coals which have an established position in the market, and are thus able to make a rate, the other colliery offices have to transact business as a matter of bargain, and come to the best terms they can with their customers. This is distinctly the position of affairs at the pits down here at present. It will remain so, no doubt, over the ensuing winter; indeed, as has often been reported in these columns, until there is a revival of activity in the Cleveland iron trade and other large industries in the North, there will be so many inferior coals pressing on the market, that it will be difficult—indeed, impossible—for low-class coals, called gas, steam, or manufacturing, as desired, to improve in value. A number of the Durham pits were sunk, not with a view to shipping business, but exclusively that the output should find a local market. There is a demand for steam coals of the best quality, but the rates are low.

A number of sailing ships and steamers were chartered last week. The requisite amount of tonnage has been taken up for the moment for coasting purposes. There is, therefore, more seeking tonnage than there are orders in the market. The following business has been done in gas coal freights from the Tyne:—Steamers—Pillau, 5s.; Copenhagan, 5s.; Havre, 5s. 1½d.; Caen, 6s. 9d. Sailing vessels—Copenhagen, £7, £7 5s., and £6 15s. per keel; Bandholm, £8; Stralsund, £8; Christiania, £6 10s.

The demand for the better qualities of fire-bricks and fire-clay goods is well maintained. A quantity is shipped for Moscow and the Russian provinces, and also for Germany and Hamburg. Cement is inquired after. The manufactured iron trade of the Tyne is rather dull. Lead is a little higher. Best Spanish is selling at £13 15s. a ton. The chemical market is steady. There is little or no change in prices.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The annual general meeting of the Carluke Gas Company was held last Thursday evening—Dr. Selkirk in the chair. The financial affairs of the Company were shown to be in a satisfactory condition, and the usual dividend was declared. The Directors for the current year were chosen as follows:—Dr. Selkirk, and Messrs. Pillans, Smith, Purdie, Gilchrist, and Watt. At the close of the meeting the Directors resolved to reduce the gas 5d. per 1000 cubic feet.

On the same evening the annual meeting of the Motherwell Gas Company was also held—ex-Provost Russell, Chairman of the Company, presiding. The Clerk submitted the balance-sheet of the Directors for the past year, which recommended a dividend of 6 per cent., free of income-tax, which was agreed to. The present price of the gas to ordinary consumers is 4s. 2d. per 1000 cubic feet, and 3s. 9d. for the public lamps.

The Mid and East Calder Gaslight Company have declared a dividend of 4 per cent. on last year's profits, and have reduced the price of gas from 9s. 2d. to 8s. 4d. per 1000 cubic feet. The public lamps are supplied with gas by the Company free of charge.

At the usual monthly meeting of the Town Council of Kilmarnock, held last Wednesday evening—Provost Sturrock in the chair—the annual report of the Gas-Works Committee was under consideration. It stated that after paying interest on mortgage debentures, bonds, and other charges, there was a profit on the past year's transactions of £1208 16s. 8½d. to be added to the sum at the credit of profit and loss, but from which there had to be deducted £636 15s. as sinking-fund, being 1¼ per cent. on £42,450 of mortgage debt bonds, in accordance with the Municipal Extension Act of 1871. The amount of gas sold during the year was 38,850,000 cubic feet, being 169,000 feet less than in the preceding year. For the year ending June, 1879, the value of the gas sold, at 4s. 7d. per 1000 feet, was £8901 17s. 3½d., as against £9754 19s. 3d. in the year ending June, 1878, when the price was 5s. per 1000 feet. Notwithstanding the slight decrease in the consumption during the past year, the increase of gas sold since the works passed into the hands of the Corporation had risen to 39½ per cent. The year's income from the chemical works was £1272 9s. 2½d., which was equal to 5s. 3½d. per ton of coal carbonized. The average illuminating power of the gas supplied during the past year was 28¾ candles. After some conversation in regard to the quality and price of the gas, the report was approved of.

Since despatching my last week's "Notes," I find that one of the Perth newspapers has contributed some fresh data to the discussion of the question of the cheapest gas in Scotland. Referring to the recent remarks of the *Dundee Advertiser*, in the course of a short article, it goes on to say: "In Perth, the charge in 1874 against revenue, for the amount required to pay annuities and interest, was 1s. 10½d. per 1000 cubic feet; but now it is only 1s. 2d., or, including interest, 1s. 3½d. In Dundee, in 1874, the charge under this head was 1s. 1d. per 1000 cubic feet, and at present it is still as high as 11½d.—Perth having thus improved its position by 7d. per 1000 cubic feet, while in Dundee they have only reduced the charge by 1½d. per 1000 cubic feet."

The Committee appointed some time ago to make arrangements for carrying out the works for procuring a supply of water to Musselburgh have nearly completed their labours, and although some matters of detail are yet to be settled, it is believed that operations will now be commenced. Mr. Buchanan, C.E., has been in consultation with the authorities, and has expressed the opinion that the supply of water will be brought into the town before the close of the present year. The Edinburgh Water Trust have promised a supply of 150,000 gallons per day, at the rate of 3d. per 1000 gallons. This will give over 15 gallons per day per head of the population, which, with the local wells, will be quite sufficient for all purposes. It is, of course, impossible to estimate the expense of the works, but a member of the Committee,w ho has an intimate acquaintance with the whole subject, states that an assessment of little over 1s. in the pound will possibly be required.

Judging by a report presented to the Dundee Water Commissioners, at their usual monthly meeting, held last week, by a Committee appointed some time ago to consider and report as to the charges for special supplies, &c., they are now in a very awkward position. Suffering from the costliness of what has been called the "bursting" route, adopted contrary to the advice of Mr. J. F. Bateman, who is generally regarded as the most eminent water engineer of the day, they are compelled to devise some means of raising their revenue. Already the domestic consumer has been given to understand that he is to bear an additional 3d. per pound; and now those who use water for trade purposes are to have the charges upon them raised from 15 to 33 per cent. Those who pay by meter are to pay 7d. instead of 6d. per 1000 gallons, which is an advance of 16 per cent., the Manager, however, being allowed discretionary power in dealing with the larger consumers. This action on the part of the Water Commissioners may lead to a more extended use of gas-engines.

The Glasgow pig iron warrant market was exceedingly strong last week, and a very large amount of business was done at advancing prices. A considerable degree of animation has been caused by the re-appearance of a demand for America. The feeling of buoyancy displayed in the market imparts general strength and activity to the trade. Prices advanced from 40s. 9d. per ton cash on Tuesday to 41s. 11d. cash on Friday.

A good deal of excitement has arisen in the local coal market during the past week, and prices have in a number of instances advanced at least 3d. per ton—a fact which will encourage the miners to prosecute their request for an advance of wages with more confidence.

Rochester and Chatham Gas Company.—The half-yearly meeting of this Company was held on Thursday last—Mr. E. Winch in the chair. The usual dividends on the different classes of shares were declared, and the retiring officers of the Company re-elected.

Elland-cum-Greetland Gas Company.—The half-yearly meeting of this Company was held on Monday, the 4th inst. The report, which was unanimously adopted, stated that in consequence of increased revenue from residuals the Directors had pleasure in announcing a reduction in the price of gas to 3s. 6½d. per 1000 cubic feet; this desirable result having been achieved through the erection of two of Messrs. R. Dempster and Son's tower scrubbers. The retiring Directors and the Auditors were re-appointed, and a vote of thanks to the Chairman concluded the proceedings.

The Alleged Impurity and Deficiency of Illuminating Power of Salford Gas.—At the meeting of the Salford Borough Council last Wednesday, a letter was read from Mr. Samuel Hunter, Engineer and Manager of the gas-works, with reference to a complaint made at the previous meeting that the gas supplied by the Corporation was impure and deficient in illuminating power. Mr. Hunter says: "I have investigated the case, and find there are no substantial grounds for complaint. During the past year I have made and recorded the result of 1300 carefully-conducted experiments on the illuminating power of the gas. These are confirmed by 70 other tests made by Dr. Angus Smith, F.R.S. The result shows that we give, on an average, gas of an illuminating power equal to 20 sperm candles, being very much richer than gas supplied by most corporations, and 2 candles more than required by the Salford Act of Parliament. The purity of the gas is proved to be equal to that of any well-managed works in the United Kingdom. There is no foundation for the complaints about the alleged bad quality of our gas, and the notion that impure gas blackens the ceiling is erroneous. It is impossible for any impurity in our gas to discolour any ceiling, but a rich gas imperfectly consumed will do so. The remedy is entirely in the hands of the consumer, who must adopt better burners, pay more attention to the proper combustion of the gas, and the necessity for ventilation."

Diss Gaslight and Coke Company.—The annual general meeting of this Company was held on Wednesday last—Mr. Cupiss in the chair. The report read by the Secretary (Mr. Garrod) showed that the income for the year from all sources amounted to £2546 14s. 9d., and deducting the expenditure a balance was left of £994 8s. 10d., against £625 last year. The profit and loss account showed a clear gain to the Company of £613 19s. 6d., as against £370 15s. 5d. the previous year. The Directors recommended a dividend of 10 per cent., and a resolution that this sum should be paid was carried unanimously. The retiring Directors were re-elected, and Mr. J. Aldrich was re-elected Managing Director. Mr. Garrod stated that the Directors had had under their consideration to reduce the price of gas to 5s. per 1000 after the 1st of January next. The expenditure now being incurred for a new gasholder, and a prospective expenditure for new mains, would require about £1000, a portion of which (£500) he suggested should be taken from their accumulated capital, and the remainder raised by the creation of 100 new shares of £5 each. It was resolved to recommend the Directors to reduce the price of gas to 5s. per 1000 feet from the 1st of January next, and to increase the capital of the Company by the issue of 100 new shares of £5 each, and offer them to the present Shareholders, *pro ratâ*, at par. A vote of thanks to the Chairman concluded the business.

Lower Thames Valley Main Sewerage Board.—A meeting of this Board was held on Wednesday last, when the Clerk reported that the Master of the Rolls had granted an interlocutory injunction (see *ante*, p. 141), restraining the Board from paying the expenses of the late Bill in Parliament until the hearing of the action against the Board on its merits. The Board, at the last meeting, instructed him to defend the action, and he was taking steps to do so under the directions of the Chairman. It could not possibly come on before November, and it was very improbable that it would be heard before December. The Works and Parliamentary Committee afterwards reported—"That—in view of the litigation pending against the Board (still undecided); the notice of surcharge on some of the members, amounting to over £2000, received from the Auditor, and from which it appears that the members of the Board cannot discharge the arduous duties imposed upon them without incurring the risk of serious personal responsibility; and having regard also to the refusal of Lord Hotham's trustees to proceed with the provisional agreement for the sale of their land and water rights, unless this Board first makes a payment to them, which the law will not sanction—this Committee is of opinion that no further proceedings should at present be taken relating to, or dealing with the sewage, but that the same be adjourned until the meeting of the Board on the first Wednesday in October, and to which day we recommend the meeting of the Board shall be adjourned accordingly." On the motion for the adoption of this report, an amendment was proposed—"That the report be not received; and that Mr. Haywood's scheme be abandoned from the present time;" but, after considerable discussion, it was lost by 9 votes to 4. The report was, therefore, adopted.

Hinckley Gas Company.—The seventh annual report of the Directors of the Hinckley Gaslight and Coke Company states that the net receipts for gas, rent of meters, and products, with gas-fittings and repairs, amount to £4394 15s. 4d., being £686 8s. 5½d. over the previous year. The new machinery and plant have been in full work the whole of the past year, and contributed considerably to the increased profits. The Directors, acting, as usual, on the principle of inducing consumption by adopting moderate prices, issued a new and reduced scale for gas, commencing from Christmas last, such reduction ranging from 3d. to 8d. per 1000 feet, according to the quantity consumed. A gas exhibition was held in the Town Hall in December last, for the purpose of showing the utility and advantages of gas for cooking and heating as well as for lighting. Great interest was taken in the matter, and the Directors were gratified by the success attending it. A considerable number of gas-stoves are now in use. For some years the parishioners of Burbage have been anxious that the village should be lighted with gas, and in March last a public meeting was held there to consider the matter, when a deputation from the Directors attended by invitation, which resulted in the Directors deciding to lay the mains for the purpose. To meet the supply to Burbage, and the continually increasing consumption of Hinckley, necessitated the enlargement of the mains over a good part of the town, and will also require the construction of a tank and gasholder, for which an eligible site adjoining the works has been secured. For the above purposes new capital will be required, and the Directors propose to issue 1000 new £10 shares, the same to be offered to the existing Shareholders *pro ratâ*—one new share to two old ones—and call up the necessary amount, £4000 to £5000. This was deferred, in consequence of the Local Board being desirous to purchase the gas-works. The negotiations have been entered into and a price agreed upon—viz., £30,000, exclusive of the cost of the proposed enlargement and extensions. The matter is subject to the approval of the Local Government Board on the one part, and the Shareholders of the Gas Company on the other. As soon as a provisional agreement is arranged with the Local Board, a special meeting of the Shareholders will be called for the purpose of considering, and, if thought fit, confirming the proposed sale. The net profits for the year are £1705 7s. 10d., of which £1500 is required to pay a dividend of 15s. per share, equal to 10 per cent., leaving the sum af £205 7s. 10d. unappropriated.

Birmingham Corporation Water Supply.—At a meeting of the Birmingham Town Council, last Tuesday, the Water Committee presented a report, which, among other things, stated that the authority conferred upon the Council by the Birmingham (Corporation) Water Act, 1879, to raise a further sum of £300,000, for the purposes of the water-works undertaking, had led the Committee to consider whether a more advantageous method of providing the requisite capital for the purposes of their department might not be adopted than that at present existing, and the Committee were of opinion that the time had now arrived when it would be expedient for the Council to avail themselves of the power contained in the 38th section of the Birmingham (Corporation) Water Act, 1875, and to issue debenture stock in substitution for the present system of borrowing loans upon mortgage. For that purpose the Committee recommended that they be authorized to consolidate the mortgage debt of the late Birmingham Water-Works Company, amounting to £189,000; the sum of £164,144 2s. borrowed under the powers of the Act of 1875 (including £14,144 2s. for redemption of annuities); and the £300,000 authorized to be borrowed by the Act of 1879, and to convert the same into debenture stock, and that such stock, when created, shall be denominated Birmingham Corporation Debenture Stock, or Birmingham Corporation Water-Works Debenture Stock (Consolidated Loans). The Committee further reported (as mentioned in last week's Journal) that the deep well and pumping-station at Selly Oak have been completed, and are now available for the supply of water. The cost thereof, including the purchase of land and the construction of mains from Selly Oak to the Monument Lane and Hagley Road reservoirs, and all the works and cottages connected therewith, have been about £36,000. The present daily yield of water is about 800,000 gallons. Powers are contained in the Water-Works Acts for the construction of galleries in connection with this well, which, it is estimated, when completed, will increase the daily supply of water to about 2 million gallons. They also reported that they had transferred a further sum of £7000 to the credit of the reserve-fund account, making a total of £17,858 4s. now available for contingencies. In addition to that there was also a surplus of £4400 9s. 6d. at present unappropriated. The sums borrowed for the purposes of the capital account of the water department, amounting to £80,000, had been obtained at the following rates of interest, viz.:—At £4 per cent., £71,000; at £3 15s. per cent., £600; at £3 10s. per cent., £8400; the average rate of interest being £3 18s. 10·80d. per cent. After a short discussion, the report and recommendations were, on the motion of the Chairman of the Committee (Alderman Avery), agreed to.

LOCAL GOVERNMENT BOARD INQUIRY AT BURY.—Mr. J. T. Harrison, C.E., attended at the Council Chamber, Bury, on Friday, the 25th ult., for the purpose of inquiring into the subject matter of the application of the Town Council to borrow a sum of £40,000 for sewerage purposes. Mr. F. Bull, the Town Clerk, said that the population of the borough was 50,000, and the rateable value £214,651. The expenses of the construction of sewers must be borne by a sewer-rate levied upon the owners of property. The present rate was 6d. in the pound, and this would raise a sum sufficient for repairs and for the repayment of the sum now proposed to be borrowed, together with interest, in 30 years. Mr. J. Cartwright, C.E., the Borough Surveyor, produced the plans, duplicates of which had been deposited with the Local Government Board, and described the scheme as consisting of two divisions — first, sewers for new streets; secondly, sewers for the interception and conveyance of the sewage to the outfall. Of these sewers there were two—viz., the Roach and the Irwell. These intercepting sewers would, when completed, convey the whole of the sewage of the borough to one point. The former portion of the scheme—the sewers for new streets, of which there were some 10½ miles—required immediate construction, and the estimated cost was £11,830, being at the rate of £651 6s. per mile, to which must be added a sum of £3872 10s. for manholes, ventilators, and street gullies; making, under this head a total of £15,702 10s. The second division—the intercepting sewers—embraced over five miles in length of brick sewers, varying in size from 3 ft. by 2 ft. to 4 ft. by 2 ft. 8 in., the estimated cost of which was £30,148 15s. The sewers are designed to convey the sewage from double the present population, together with a rainfall of ¼-inch in 24 hours, the sewers running two-thirds full with a velocity of 4½ feet per second. Storm overflows would be provided at the present outlets, which, in heavy falls of rain, would convey the water direct into the river. The land at the proposed outfall was situate within the borough, near the confluence of the Roach with the Irwell, and both as to position, soil, and levels was well fitted for sewage purification works. The Inspector observed that as the Town Council had not come to any determination with respect to the purification of the sewage on its arrival at the outfall, he did not think the Local Government Board would favourably consider the application. Mr. Cartwright pointed out that the Town Council had shown, by the plans lodged with the Local Government Board, how they could intercept and convey the sewage to one point, and they were in negotiation for the land, and therefore the Board might be led to grant the money for the construction of the sewers in new streets, whilst the plans for purification works were being matured. The Inspector again intimated that the Local Government Board would not be favourable to the grant of the £15,000 unless the Council gave proof of their intention to proceed with some system of purification. Mr. Harrison, in company with the Borough Surveyor, then proceeded to view the proposed outfall, and expressed his approval of it.

Register of Patents.

APPLICATIONS FOR LETTERS PATENT.

3068.—LAKE, W. R., Southampton Buildings, London, "Improvements in the manufacture of illuminating gas and in apparatus therefor." A communication. July 28, 1879.

3085.—MILLS, B. J. B., Southampton Buildings, London, "Improvements in regulators for the electric light." A communication. July 30, 1879.

3140.—CLAYTON, S., Bradford, Yorks, "Improvements in motor-engines worked by gas or combustible vapour and air." Aug. 4, 1879.

PATENT WHICH HAS PASSED THE GREAT SEAL.

1959.—HOPKINSON, J., Westminster Chambers, London, "Improvements in electric lamps." May 16, 1879.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2824.—LINFORD, C., "Improvements in gas-engines, and in appliances connected therewith." July 11, 1876.

2831.—CLARK, A. M., "Improvements in water-meters." July 11, 1876.

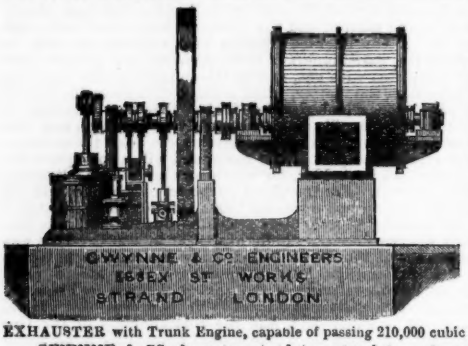
2939.—DWYER, E., "Improvements in lamps and apparatus for automatically extinguishing lamps." July 19, 1876.

2994.—MESSENGER, T. G., "Improvements in valves for the circulation of hot water, which improvements are also applicable to the circulation of cold water, gas, or other fluids." July 25, 1876.

3010.—SMITH, W., "Improvements in fluid meters or engines for measuring or obtaining power from water, air, or gas." July 26, 1876.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

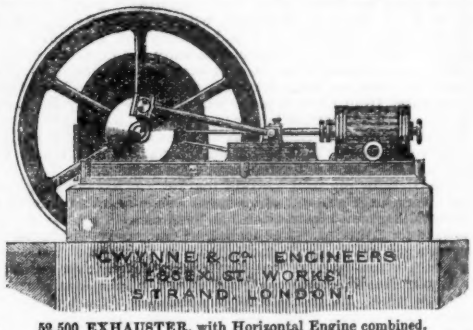
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

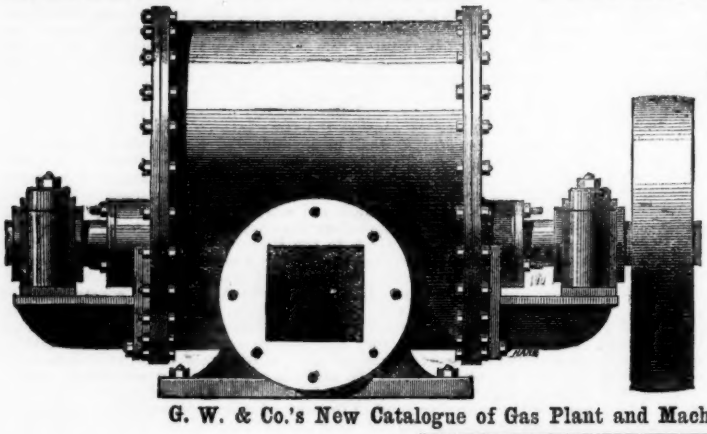
GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS,



WITH OR WITHOUT

WROUGHT-IRON SPINDLES AND

ENGINES COMBINED.

GEORGE WALLER & CO.,

MAKERS OF

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HYDRAULIC MAIN VALVES,
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TAR, LIQUOR, AND OTHER PUMPS,
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G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.

PHŒNIX ENGINEERING WORKS:

HOLLAND STREET, SOUTHWARK, S.E.

WANTED, Readers of the NEW Edition, 1879, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, A.I.C.E., Gas-Works, SYDENHAM, S.E.

WANTED, by Advertiser, aged 21, a Situation in a Gas-Works, as ASSISTANT to the Engineer. Good Draughtsman and Chemist.
Address No. 565, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

READING GAS COMPANY.

WANTED at once, a thoroughly good Second-Hand STATION-METER for about 30,000 feet per hour.
Apply, with full particulars, to Mr. E. BAKER, Engineer.

WANTED, by a Stourbridge House, an AGENT for Sale of Gas Retorts and Fire-Bricks in London and the South. Preference to one acquainted with the trade, or already known by the Gaslight Companies.
Address No. 569, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Young Man, aged 23, a Situation in a Gas-Works. Five years experience in a works making 80 millions. Can use Photometer, fair Draughtsman, good writer, quick at figures, and thoroughly understands general routine.
Address Z., 115, Westfield Street, St. Helen's, LANCS.

GAS-WORKS SUB-MANAGER.

WANTED, by the Corporation of Walsall, a Working SUB-MANAGER for the Walsall Gas-Works; to enter upon his duties early in November next. Salary £150 a year, with house, coal, and gas free. The appointment to be subject to three months notice on either side.
Applications, accompanied by not more than three testimonials, to be sent to the undersigned on or before Thursday, the 28th of August inst.
Applicants canvassing the members of the Corporation will be disqualified.
A statement of the duties and conditions of the appointment may be obtained on application to the undersigned.
SAML. WILKINSON, Town Clerk.
Walsall, Aug. 9, 1879.

AN Engineer of large experience is in want of an Engagement as MANAGER or SECRETARY and MANAGER of a medium-sized Gas-Works. Manufacture of Residuals a specialite. Would go abroad. Payment by results. Testimonials and references to previous employers.
Address No. 567, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A Gentleman (Assoc. Inst. C.E.), 29 years of age, wishes to obtain a Re-engagement as Engineer-in-Chief to a Gas Company abroad. Has had nine years experience in Gas matters, and received his professional education in two of the largest Gas-Works in Europe, and was employed for three years as Chief Engineer to a Gas Company abroad.
Address W. R. J., care of T. H. Devonshire, Esq., Solicitor, 1, Frederick's Place, Old Jewry, LONDON, E.C.

BOOK-KEEPING.—Instruction and Practice wanted in Auditing Books, those of a Gas Company in particular.
Address CARBON, Messrs. Deacon's, Leadenhall Street, E.C.

DRY GAS-METERS.

WE have a large extra Stock of these, in three, five, and ten lights, of the best make, that we can offer at less than half the list price. Have been tested by the City Gas Inspector. Also a few 100 to 300 lights, equally low in price.
HODGE AND CO., Gas Engineers, 100 and 101, Hatton Garden, LONDON, E.C.

FOR SALE.—A First-class Tar Factory, with Benzole Refinery attached; the whole erected within the past three years, and in the best possible condition. Doing a business of 3000 to 4000 tons per annum. The factory is situated on its own wharf in a first-class harbour. Satisfactory reasons for disposal.
Principals or solicitors only in first case, apply by letter addressed No. 563, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

EXHAUSTER FOR SALE.

FOR SALE, an Engine and Exhauster combined, to pass 7000 feet per hour, together with Boiler, 12 ft. by 4 ft., Boiler Fittings, Connections, Regulator, and Stone Bed.
For particulars, apply to W. T. TEW, Gas-Works, WARWICK.

TO BE SOLD, Cheap, Three Telescopic GASHOLDERS, two 60 ft. diameter and 20 ft. deep each lift, and one 70 ft. in diameter and 20 ft. deep. Only been in use eight years. May now be seen at work at the Effingham Street Gas-Works, Sheffield.
For price, apply to THOMAS PIGGOTT AND CO., Spring Hill, BIRMINGHAM.

BARNET DISTRICT GAS & WATER COMPANY.
NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of the PROPRIETORS of the above Company will be held at the Guildhall Tavern, Gresham Street, in the City of London, on FRIDAY, the 29th day of August, 1879, at One o'clock in the afternoon precisely, to receive the Report of the Directors, and the Accounts for the half year ending the 30th day of June last, to declare a Dividend, to elect an Auditor, and to transact the general business of the Company.
The Transfer Books will be closed from the 16th to the 29th inst., both inclusive
By order of the Board,
ALFRED LASS, Secretary.
Offices, 30, Gracechurch Street, London,
Aug. 1, 1879.

THE MITCHAM AND WIMBLEDON DISTRICT GASLIGHT COMPANY.
INCORPORATED BY ACT OF PARLIAMENT, 1867.
NOTICE is hereby given that the TWENTY-FIFTH ORDINARY HALF-YEARLY GENERAL MEETING of the SHAREHOLDERS of this Company will be held in the Board-Room at the Works, Mitcham, in the County of Surrey, on TUESDAY, the 26th day of August, 1879, at Three o'clock in the afternoon precisely, to declare a Dividend for the half year ending the 30th day of June, 1879, and for general business.
The Transfer Books will be closed from the 11th till the 25th day of August inst.
By order,
BENJAMIN GREEN, Secretary and Manager.
Board-Room, Mitcham, Surrey, Aug. 6, 1879.

TANKS.—Several stout square wrought- iron TANKS, from 2000 to 3000 gallons, suitable for Tar, Anthracine, Oil, &c., are for sale, cheap. Also several Pressure Boilers, 6 ft. by 4 ft., suitable for Benzole or Naphtha, Rectifying, &c.; Office Furniture, Platform Weighing-Machine, and Sundries.
Address No. 562, care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

GAS PLANT FOR SALE.

A 10-in. Vertical Pipe Condenser, having 20 Pipes, each 19 ft. high, on Cast-Iron Base Box.
A Scrubber, 16 ft. high 5½ ft. diameter, fitted with thin boards, Self-Acting Liquor Distributor, 10-in. inlet and outlet pipes.
Two Single-Flue Cornish Boilers (new in 1870), each 9½ ft. long, 3 ft. 9 in. diameter; Fire Tube of Low Moor Iron, complete with all Fittings.
All in good working order; removed to make room for larger plant.
For further particulars apply to THOS. TREWHITT, Gas-Works, WEST HARTLEPOOL.
May 8, 1879.

THE Peterborough Gas Company require TENDERS for the Purchase of the Surplus TAR produced at their Works for One year, ending June 30, 1880. The Tar to be delivered by the Company into the Contractor's tank trucks at the Great Northern Railway Station, Peterborough.
Tenders to be delivered to me on or before Monday, the 18th of August inst.
G. E. STEVENSON, Engineer and Manager.
Gas-Works, Peterborough.

MILLOM LOCAL BOARD.

THE Local Board invite Tenders for a Supply of about 500 Tons of good GAS COAL, well screened and free from pyrites. To be delivered at the Millom Station between the present time and the end of August, 1880, in such quantities and at such hours as may be required.
Tenders to be sent to me not later than the 25th inst.
The Board do not bind themselves to accept the lowest or any tender.
JNO. POOLE, Clerk.
Millom, Carnforth, Aug. 6, 1879.

WIDNES GAS-WORKS.

THE Widnes Local Board invite Tenders for the Purchase of the TAR and AMMONIACAL LIQUOR produced at their Works, for a term of Twelve months, from the 1st of October next.
Tenders, endorsed "Tar" or "Liquor," as the case may be, and addressed to the Chairman of the Gas and Water Committee, to be delivered at the above works (where conditions of contract can be obtained) not later than 10 a.m. upon the 30th of August.
The Board do not bind themselves to accept the highest or any tender.
HENRY ROBERTS, Engineer.
Public Offices, Widnes, Aug. 11, 1879.

STOW-ON-THE-WOLD GAS AND COKE COMPANY, LIMITED.

RE-CONSTRUCTION OF TANK FOR GASHOLDER.

THE Directors invite Tenders for the above work, plans and specifications of which may be seen at the Manager's Office, at the Gas-Works, Stow-on-the-Wold. The tank is about 26 feet internal diameter, and 11 feet in depth.
The lowest or any tender not necessarily accepted.
Tenders to be sent, not later than the 23rd inst., to
JABEZ ROFF, Secretary.
Stow-on-the-Wold, Aug. 8, 1879.

TOWN of LLANTRISSANT, GLAMORGANSHIRE.

VALUABLE GAS-WORKS FOR SALE.

MESSRS. Stephenson, Alexander, & Co. are instructed to sell by Auction, by order of the Mortgagees, in One Lot, at the Royal Hotel, in the town of Cardiff, in the county of Glamorgan, on Aug. 19, 1879, at Two o'clock precisely in the afternoon, the following valuable and well-constructed Freehold and Leasehold Gas-Works, the property of the Llantrissant Gaslight and Coke Company, Limited, viz.:—
All that piece of Freehold Land containing an area of 1622 Square Yards or thereabouts, together with the Gas-Works and Manager's Dwelling-House erected thereon, and all the Plant, consisting of Gasholder, Retorts, Purifiers, Condenser, Scrubber, Governor, Steam-Boiler, Exhauster, Mains, and other Machinery usually employed in the Manufacture and Supply of Gas. Also all that piece of Leasehold Land containing an area of half an acre or thereabouts, together with the Gas-Works, Cottage, and similar Machinery to the above. Also Pillars and Brackets with Lamps for Lighting Public Streets, and a large quantity of Meters and several thousand yards of Mains. Also about 198 Yards of 3-in. Cast-Iron Pipe in 9 ft. lengths, stowed at the Works.
The leasehold premises are held for a term of 99 years from Aug. 2, 1875, under a lease granted by Vaughan Hanning Vaughan Lee, Esq., M.P., at the yearly rent of £20.
The freehold and leasehold Works are connected, and gas can be supplied to the whole of the district of supply from both or one of them.
The freehold Gas-Works have been in operation for upwards of 12 years, and the leasehold portion was recently added to meet the increased requirements of the district.
The town of Llantrissant is situated within the South Wales mineral basin, and is 12 miles distant from Cardiff.
The works have been supplied with superior gas coal from neighbouring collieries at moderate prices, and gas is supplied to the stations of the Llantrissant and Taff Vale Junction Railway, and to the station, offices, and signals of the Great Western Railway at Llantrissant, besides a large tin-works and waggon works and the houses in the town of Llantrissant, and the villages in the immediate neighbourhood thereof.
Further particulars, plans, and conditions of sale can be had of Messrs. SPICKETT AND PRICE, Solicitors, Pontypridd, GLAMORGANSHIRE.

TENDERS.

THE Devonport Gas and Coke Company are prepared to receive TENDERS for Repair of GASHOLDER; and also for the Removal of a Telescopic GASHOLDER and FRAME.
Specifications may be had on application.
JOHN WILLING, Secretary.
Aug. 2, 1879.

TO IRONFOUNDERS.

THE Gas Committee of the Padiham and Hapton Local Board require TENDERS for the Supply of about 2460 Yards of 4-in. Turned and Bored PIPES, &c.
Particulars may be had on application to Mr. J. R. Smith, Gas Manager, Padiham.
Sealed tenders, endorsed, to be sent in on or before the 13th of August, addressed
ROBT. DUCKWORTH, Clerk to the Board.
Padiham, Aug. 1, 1879.

Price 28s., handsomely bound in Morocco, cloth sides, gilt edged and lettered.

THE FIRST VOLUME
OF
KING'S TREATISE
On the Science and Practice of the Manufacture and Distribution of
COAL GAS.
Edited by THOS. NEWBIGGING, C.E., M.Inst.C.E., and W. T. FEWTRELL, F.C.S.

Orders received by
WALTER KING, 11, Bolt Court, Fleet Street, London, E.C.

Prices, half bound, cloth sides, 2 quires, 30s.; 3 quires, 36s.; other sizes and bindings to order.

THE
GAS COMPANIES EXPENDITURE JOURNAL,
Being a Ruled Account-Book with Printed Headings, and Analyzing Guide for Keeping, upon the easiest and most correct method, the Expenditure of a Gas Company, in accordance with the provisions of the Gas-Works Clauses Act of 1871, and suitable for all Companies.

Specimen, with illustration and full particulars; 2s. 6d. returned on the purchase of a "Journal."

Published by SANDELL AND SON, Accountants, 2, Great George Street, WESTMINSTER, and W. KING, Office of the JOURNAL OF GAS LIGHTING, 11, Bolt Court, FLEET STREET, E.C.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.
Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.
Patents procured for Foreign Countries.
Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 29, Great George Street, WESTMINSTER.

Now ready, Second Edition, price 7s., by post 7s. 3d., the
GAS MANAGER'S HANDBOOK.
By THOMAS NEWBIGGING, M.I.C.E.

Orders to be sent to
WALTER KING,
11, BOLT COURT, FLEET STREET, LONDON, E.C.

THE Gloucester Gas Company, ceasing to manufacture gas at their old works, will have the undermentioned APPARATUS for Sale about the beginning of August, viz.:—

110 Mouthpieces, D-shape, 13 in. by 22 in., with Wrought-Iron Lids, Cross-Bars, Stand, Bridge, and Dip Pipes. Also about 150 feet of D-shape Wrought-Iron Hydraulic Main, size 19 in. by 19 in. 28 Mouthpieces, D-shape, 16 in. by 20 in., with Wrought-Iron Lids, Cross-Bars, Stand, Bridge, and Dip Pipes. Also about 38 ft. of D-shaped Wrought-Iron Hydraulic Main, size 20 in. by 20 in. Annular Condenser, consisting of six Vertical Pipes, 24 in. diameter, 19 ft. high, with three 12 in. Slide-Valves and 12 in. Connections.

Scrubber (round), 5 ft. by 20 ft., with three 12-in. Slide-Valves, and 12 in. Connections.

Exhauster (Jones) to pass about 15,000 feet per hour.

Exhauster (Beales) to pass about 25,000 feet per hour.

Two Vertical Steam-Engines, each about 6-horse power, with Pulleys, and Shafting used for driving the above.

Boiler 14 ft. 6 in. by 3 ft. 6 in., with Centre Tube, and four Galloway Patent Tubes.

4-horse power Horizontal Steam-Engine.

Three 4-in. Pumps, with cranked Shafting and a pair Mitre Wheels.

Set of four Purifiers, 12 ft. by 12 ft. by 4 ft., with 12-in. Centre-Valve (Cockeys), and Connections and Lift complete.

Station-Meter by A. Wright and Co., London, with three 12-in. Slide-Valves, and 12-in. Bye-Pass and Connections, to pass about 25,000 feet per hour.

Gasholder, Double Lift, with Cast-Iron Tank, capacity 37,000 feet.

Gasholder, Double Lift, capacity 100,000 feet.

Gasholder, Double Lift, capacity 240,000 feet.

Two 12-in. Governors, by Wright, London, with 12-in. Valves, Bye-Pass, and Connections.

Two 12-in. four-way faced Valves, by Cockey.

For further information, &c., apply to the undersigned.

R. MORLAND, Engineer.

THE

IMPERIAL METER CO.,

LIMITED,

(Formerly Walter Ford, at Gray's Inn Road),

KING'S ROAD, ST. PANCRAS,

Manufacturers of THE IMPROVED DRY GAS-METER, THE PATENT WET GAS-METER, Special Meters for Public Lighting, STATION-METERS, Governors, &c.

TO MAKERS OF SULPHATE OF AMMONIA AND BUYERS OR SELLERS OF GAS LIQUOR.

F. SUTTON & CO., Norwich, are now prepared to Supply a Set of Apparatus with Standard Test Solutions for the rapid and accurate analysis of Gas Liquor, which can be used by any intelligent workman, so as to show the actual amount of Sulphate which can be got out of any sample of liquor in a few minutes, without any of the annoyance arising from saturation with acid, &c. Tables are also given, showing the quantity of acid of various strengths required for any given liquor, the accurate ounce-strength and percentage of pure ammonia, &c. Price of the set, with full direction and table (copyright), with materials sufficient for fifty analyses, £4 4s.

Post orders or cheques to be made payable to F. SUTTON AND CO., Manufacturing Chemists, NORWICH, who also supply every description of Standard Solutions for Volumetric Analysis of Waters, Beers, Manures, &c., of guaranteed accuracy.

TO TAR DISTILLERS.

THE Directors of the Brentford Gas Company are prepared to receive TENDERS for the purchase of the Surplus TAR produced at their Brentford and Southall Works for the period of One year, from the 1st day of October next. Approximate quantity 600,000 gallons.

Sealed and endorsed tenders to be sent in not later than the 16th inst.

For further information, apply to Frank Morris, Engineer, Brentford Gas Company.

By order,

WILLIAM CROXFORD, Secretary.

Gas Office, Brentford, Aug. 1, 1879.

E. & W. H. HALEY,

IRONFOUNDERS & MAKERS OF

CAST-IRON PIPES

FOR

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W. C. HOLMES & Co.,

ENGINEERS AND CONTRACTORS

FOR

GAS AND WATER-WORKS,

HUDDERSFIELD.

REFERENCES TO UPWARDS OF 400 WORKS.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.

John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

ALFRED LASS, F.I.Accts.,

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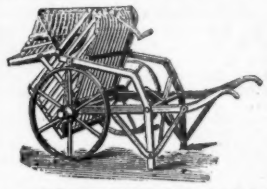
Accounts Analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.

The Forms of Account, which have been specially designed by Mr. Lass to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, Corporations, and Local Boards.

TO ENGINEERS & MANAGERS.

CLIFTON'S PATENT BARROW



Is acknowledged to be the best in the market; made out of Sheet or Flat Bar Iron.

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THAMES BANK IRON COMPANY,

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SOCKET-PIPES FOR GAS OR WATER PURPOSES,

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Erected complete on the most Improved Principles.

ECONOMY IN THE PRODUCTION OF GAS, AND CARBON DEPOSIT ENTIRELY PREVENTED.

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FOR JOINTING AND REPAIRING RETORTS AND OVENS *in* ACTION AND *out* OF ACTION.

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Now Ready, Price One Guinea,

PRECEDENTS IN PRIVATE BILL LEGISLATION

AFFECTING GAS AND WATER UNDERTAKINGS.

COMPILED BY MR. G. W. STEVENSON, C.E., F.G.S.

This Work contains information with regard to the practice of Parliament during the last fourteen years, in regard to most of the points on which differences arise in Opposed Bills for Gas and Water Undertakings, comprising—Authorized share and loan capital, Rates of dividend, Capitalization of profits, Term for the repayment of loans, Instances in which new shares are to be sold by auction and Exceptions to the Standing Order requiring new shares to be sold by auction, The limitation of back dividends, Illuminating power, Purity, Price, Notice before testing, The conditions under which the public supply of gas is regulated, Alteration of mains, Instances in which maps of mains are required, and All cases in which undertakings have been transferred, since 1845 in gas and 1865 in water, from Companies to Local Authorities.

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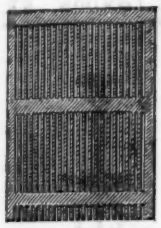

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BRADDOCK'S PATENT COMPENSATING GAS-GOVERNORS;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

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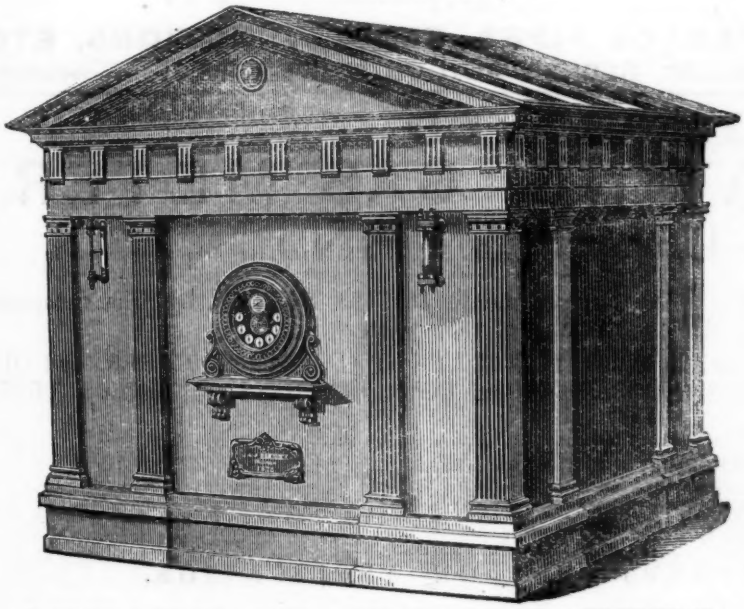

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WITH PLANED JOINTS.

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Home and Foreign Orders promptly attended to.

All Sizes of **CONSUMERS METERS, STATION-METERS, and GOVERNORS** generally in Stock.

Orders almost invariably despatched on the day of receipt.

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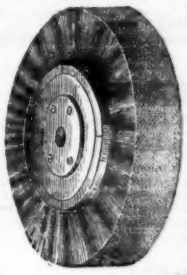

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Circular Casting Brushes & Brooms,

Admirably adapted for Cleaning Hot Castings, &c., and for general use in foundries, gas-works, chemical works, &c. As supplied to the Government and the leading English and Foreign Engineers, Gas-Works, &c.

Broom

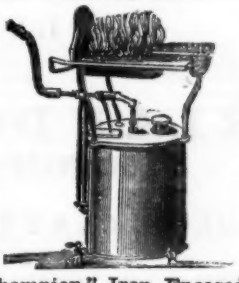
No. 1, Brush,	3in.	wire,	2	rows,	15s.	dozen.	
,, 2, ,,	5	,,	round,	22s. 6d.	,,		
,, 3, ,,	3	,,	4	rows,	22s. 6d.	,,	
,, 4, ,,	2	,,	4	,,	21s.	,,	
,, 5, ,,	3	,,	4	,,	22s. 6d.	,,	
,, 6, Broom,	12in.	block,	7	in.	wire,	4	rows, 72s. per dozen.
,, 7, ,,	16	,,	7	,,	4	,,	96s. ,,
,, 8, ,,	upright,		7	,,	2	,,	48s. ,,
,, 9, ,,	12in.	block,	7	,,	10	,,	180s. ,,
,, 10, ,,	16	,,	7	,,	10	,,	228s. ,,
,, 11, ,,	12	,,	4	,,	4	,,	56s. ,,
,, 12, ,,	16	,,	4	,,	4	,,	72s. ,,
,, 13, ,,	12	,,	4	,,	10	,,	132s. ,,
,, 14, ,,	16	,,	4	,,	10	,,	180s. ,,

									each
Wheel,	6in.	dia.,	2¼	wide,	17	wire projects,	5	rows, ½ hole,	10s.
,,	8	,,	2½	,,	12	,,	6	,, ,,	16s.
,,	10	,,	3	,,	2½	,,	6	,, ,,	21s.
,,	12	,,	3½	,,	3¼	,,	7	,, 1	28s. 6d.
,,	14	,,	3½	,,	3¼	,,	7	,, 1	36s.
,,	18	,,	4	,,	3½	,,	8	,, 1¼	62s. 6d.

The "Champion" Iron Encased Forges.

Are specially suited for General Out-door Purposes, and will be found suitable to any climate.

PRICES. SINGLE BLAST.	No.	DOUBLE BLAST.
64	1, 8 in. bellows, to heat ½ in. sq. in 2 min.	168
108	2, 10 in. bellows, to heat 1 in. sq. in 2 min.	132
128	3, 12 in. bellows, to heat 2 in. sq. in 2 min.	168
		216



The "Champion" Iron Encased Forge,

With Vice-Drilling Frame on stand complete.

No. 10, Double Blast, 10 in. bellows, to heat 2 in. sq. in 2 min., £15.
No. 11, Double Blast, 12 in. bellows, to heat 3 in. sq. in 2 min., £18.
No. 12, Double Blast, 14 in. bellows, to heat 3½ in. in 2 min., £22 10s.

Sole Agents for the Lightning Screwing and Drilling Machines, Helical Pulley Blocks, Automatic Revolving Scrapers, Earth Borers, Tanite Co.'s Emery Wheels and Emery Grinders, Lathes, Genuine Morse Twist Drills, Cushman's Drill and Lathe Chucks, Patent Belt Screws, Patent Safety Belt Shippers, Casting Brushes, Shaped Diamonds, and a great variety of other Machinery always kept in stock or in progress.

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HENRY LYON (14 years Engineer and Manager of the largest of the Manchester Corporation Gas-Works) Mechanical and Consulting Gas Engineer, reports upon the condition and value of Gas-Works, supplies plans and specifications of all Apparatus appertaining to Gas-Works, and re-models existing Works.
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Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

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COMMERCIAL GLASS WORKS.
BEST OPAL SHEET GLASS, IN CASES OF 200 FEET.

150 Y	7d. per foot.	26 Y	11d. per foot.
21 Y	9d. ,,	32 Y	1s. 3d. ,,

Enamelled Sheet Glass, Flint and Opal, 1s. 2d. Coloured Glass and Opal, 1s. 6d. to 2s. 6d. per foot.
GAS GLASSES OF ALL DESCRIPTIONS ON HAND; SPECIAL PRICES FOR QUANTITIES.

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ROBUS'S IMPROVED RETORT-SETTINGS, guaranteed to Carbonize a large amount of Coal with a small per cent. of Fuel.
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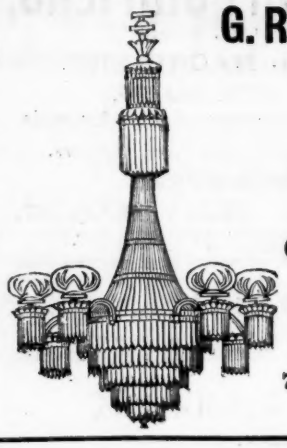

G. RAINSFORD & SON,
ESTABLISHED 1850,
MANUFACTURERS
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CHANDELIERS
AND
GAS-FITTINGS,
SUITABLE FOR
GAS COMPANIES.
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LIVESEY FIRE-CLAY WORKS.
NEAR BLACKBURN, LANCASHIRE.
(ESTABLISHED 1835.)
ORLANDO BROTHERS, LIMITED,
MANUFACTURERS OF PATENT CLAY RETORTS,
AND EVERY DESCRIPTION OF
TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.
FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

IMPROVED
COMPENSATING GAS-METER.
HUNT'S PATENT.

This Meter supplies a want long felt, by putting an end to the loss sustained by Gas Companies through the overworking of their Meters.

These Meters can now be supplied in either TIN-PLATE or CAST-IRON CASES, and OLD METERS converted to this plan. GAS COMPANIES and CORPORATIONS will find it to THEIR ADVANTAGE to adopt these Meters.

EXTRACTS FROM REPORTS.

"I am able to report that the Meters have given in each test most satisfactory results."—*Mr. H. Sporne, City of London Meter Inspector.*
"I consider the arrangement is a great improvement upon the Meters in present general use."—*Mr. T. Jackson, Meter Inspector, Birmingham.*
"I would observe from the results of my testings that the Meters are a great improvement on the ordinary Wet Meters in general use."—*Mr. H. Airey, Meter Inspector to the Metropolitan Board of Works.*

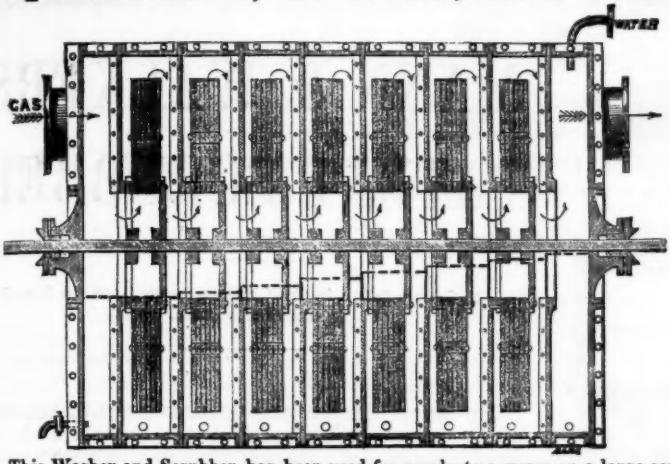
COPIES OF REPORTS SENT ON APPLICATION.

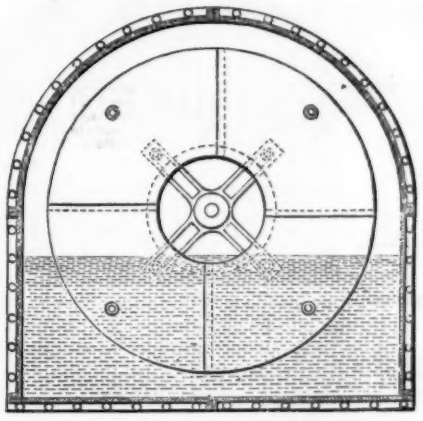
MANUFACTURED BY
JOHN BENT & SON,
WET AND DRY GAS-METER AND GAS APPARATUS MANUFACTURERS,
BELL BARN ROAD, BIRMINGHAM.
Established 1830.

THE

"STANDARD" WASHER & SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]





This Washer and Scrubber has been used for nearly two years on a large scale at the Works of The Gaslight and Coke Company, Bromley-by-Bow, at which station there are now several in operation and in course of construction. There is also one in use at the Pancras Station, King's Cross, of the same Company, which is purifying 1,500,000 cubic feet of gas per day. At the Gas-Works of the Corporation of Leeds, a large one has been erected, which is giving complete satisfaction. The Special Merits of this Washer are as follows:—

That it is a very effective Condenser, so that it is not absolutely necessary to reduce the temperature of the gas to 60°, or thereabouts, to make the Washer effective. That the distribution of the liquor is made with unerring regularity. That it occupies very small space, so that it can be, at little expense, effectually protected from extreme changes of the weather. That the considerable expense of Coke or Wood, or other Scrubbing Material, is entirely saved, and that the great nuisance and cost of from time to time replacing the Scrubbing Material is avoided. That, by the revolution of the discs, the quantity of water carried up by them, and tending continuously to fall, exposes a very large amount of fresh wetted surface to contact with the gas. That it is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured. That it is much cheaper than any other Scrubber that will do the same amount of work effectually. That it is the only Washer suitable for purifying Gas from all its impurities by solution. That it works with a minimum of pressure. That it takes out every trace of Ammonia from the Gas in once traversing the machine. That it requires very little outlay for foundations.

The following Testimonials show the opinion of eminent Engineers as to the capabilities of the Washer:—

D. HULETT, Esq. *The Gaslight and Coke Company, Bromley-by-Bow, May 3, 1877.*

Dear Sir,—In answer to your inquiries respecting the results of the working of your Patent Washer, I beg to state that I find it a very efficient machine. I have had it in operation for some time, and passed gas through it continuously at the rate of 100,000 cubic feet per hour, and obtained from it 11 gallons of 10 oz. liquor per ton of coal carbonized—results which appear to me very satisfactory for so small a Washer. It works very smoothly, taking but little power, and giving no pressure. I have it still in operation, and am perfectly satisfied with its working.

I am, dear Sir, yours truly, (Signed) W. B. WRIGHT.

Messrs. KIRKHAM, HULETT, and CHANDLER. *The Leeds Corporation Gas-Works, York Street, Leeds, Dec. 6, 1878.*

Gentlemen,—The Scrubber-Washer erected by you at these works, and which has been in use for six months, has proved to be, so far as we have been able to test it, thoroughly efficient. We are at present making 32,000 feet of gas per hour, and are entirely dependent on this apparatus for the removal of Ammonia, and the **Gas is perfectly free from that impurity in the sixth chamber,** so that four chambers remain to deal with an increasing make of gas. Owing to insufficient condensers, the gas was in the summer admitted to the Scrubber at a temperature of 70°, but was reduced therein to 61°, or that of the atmosphere. The volutes are driven at the rate of four revolutions per minute, and, working at that speed, there is not the slightest difference between the inlet and the outlet pressure. Clean water supplied at the rate of 10 gallons per ton of coal carbonized is converted into liquor of from 10 oz. to 13 oz. strength **in once traversing the vessel.** The apparatus is extremely simple and compact, occupies but little space, and requires no foundation. I shall be surprised if it does not eventually become extremely popular.

I am, Gentlemen, yours faithfully, (Signed) HENRY WOODALL, Engineer.

Messrs. KIRKHAM, HULETT, and CHANDLER. *The Gaslight and Coke Company, York Road, King's Cross, Jan. 14, 1879.*

Gentlemen,—In reply to your inquiry, I am pleased to say, the Washer which was put in action at this station in October last has quite fulfilled my expectations, as it confirms the experiments I made in May last with the smaller machine. Working at four revolutions per minute, **it takes out every particle of Ammonia,** while purifying more Gas than it was intended to do. I enclose particulars of a fortnight's working during our heaviest make, by which you will see that it yields the full quantity and strength of liquor, and works with little pressure. I am therefore quite satisfied with the machine, and trust it may meet with the success it deserves.—I remain, &c. (Signed) JOHN CLARK.

The following Table shows the results of the working of one of these Washers, lately erected to purify 60,000 feet of Gas per Hour, at the St. Pancras Station of The Gaslight and Coke Company:—

1879.	Nos. of the Divisions and Strength of Liquor in each.										Water used per Ton of Coals.	Gas Purified per Hour, Cubic Feet.	Ammonia on Outlet.	Temperature.			Pressures.		Revolutions per Minute.
	1	2	3	4	5	6	7	8	9	10				Inlet.	Outlet.	Atmosphere.	Inlet, Inches.	Outlet, Inches.	
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.									
January 1	8½	6¾	5	3½	2½	1½	¾	1	0	0	10 Gallons.	52,000	Nil.	77°	73°	48°	24	23	7½
„ 2	8¾	7	6	4½	3½	2½	1½	¾	½	0	10 „	57,000	Nil.	73°	66°	32°	21¾	20½	4
„ 3	9½	8	6	3¾	3	2½	1½	¾	½	0	10 „	60,000	Nil.	75°	68°	40°	23½	22	4
„ 4	9½	7¾	6½	4½	3½	2½	1½	¾	½	0	10 „	65,000	Nil.	74°	68°	33°	24	22½	5
„ 5	9½	7	6	4	3	2½	1½	1	½	0	10 „	34,000	Nil.	77°	68°	35°	14½	14	5
„ 6	9½	7½	6½	4½	3	2½	1½	1	½	0	10 „	63,000	Nil.	72°	66°	27°	24	22½	4½
„ 7	11	9	7	5½	3½	3	1½	1½	½	0	10 „	59,000	Nil.	74°	66°	31°	25	23½	5
„ 8	9½	7½	6	4½	3	2	1	½	½	0	10 „	75,000	Nil.	73°	61°	31°	28	26½	4½
„ 9	11	9	7	5	3½	2½	1½	1	½	0	10 „	82,000	Nil.	74°	67°	33°	27½	25½	5
„ 10	10½	8½	6½	5	3½	2½	1½	1	½	0	10 „	66,000	Nil.	76°	64°	28°	28½	27	5
„ 11	12½	10	7½	5½	4½	3½	1½	1	½	0	10 „	61,000	Nil.	73°	64°	27°	28½	25½	5
„ 12	11	8½	6½	—	—	—	1½	1	½	0	10 „	39,000	Nil.	74°	64°	27°	26½	25½	5
„ 13	13	10½	8½	6	4½	3½	2	1½	½	0	10 „	78,000	Nil.	73°	65°	42°	28	26	5

Messrs. KIRKHAM, HULETT, and CHANDLER. *Corporation of Birmingham, Gas Department, Saltley Works, May 23, 1879.*

Gentlemen,—I beg to enclose you a copy of the results of the tests which, by the kind permission of the Engineer, Mr. Clark, I made on the 6th of March last, of the working of one of your "Standard" Washers and Scrubbers at the St. Pancras Station of The Gaslight and Coke Company, and I am of opinion that, for an apparatus occupying so small a space, they are exceedingly satisfactory.—Yours truly, HENRY HACK, Engineer.

Working Results obtained from KIRKHAM, HULETT, *and* CHANDLER'S *Patent "Standard" Washer and Scrubber at the St. Pancras Station of The Gaslight and Coke Company, London, March 6, 1879.*

Gas passing per Hour, Cubic Feet.	—	Impurities in Gas per 100 Cubic Feet.			Temperature.		Pressure in Inches.	Revolution of Apparatus per Minute.	—	No. of Divisions and Strength of Liquor.										Water Used during Experiment. Gallons.
		SH_2	CO_2.	Grains. NH_3.	Washer.	Air.				—	—	—	—	—	—	—	—	—	—	
64,000	Inlet	2·00	2·00	158·8	72	57	21	4½	Twaddel deg. at 60°	5·3	4·9	2·85	2·35	1·7	1·05	0·6	0·3	0·15	0·1	63
	Outlet	1·50	1·50	0·8	68	57	20		Acid, ounces.	11·0	8·4	6·3	4·5	2·7	1·7	1·3	0·7	0·3	—	

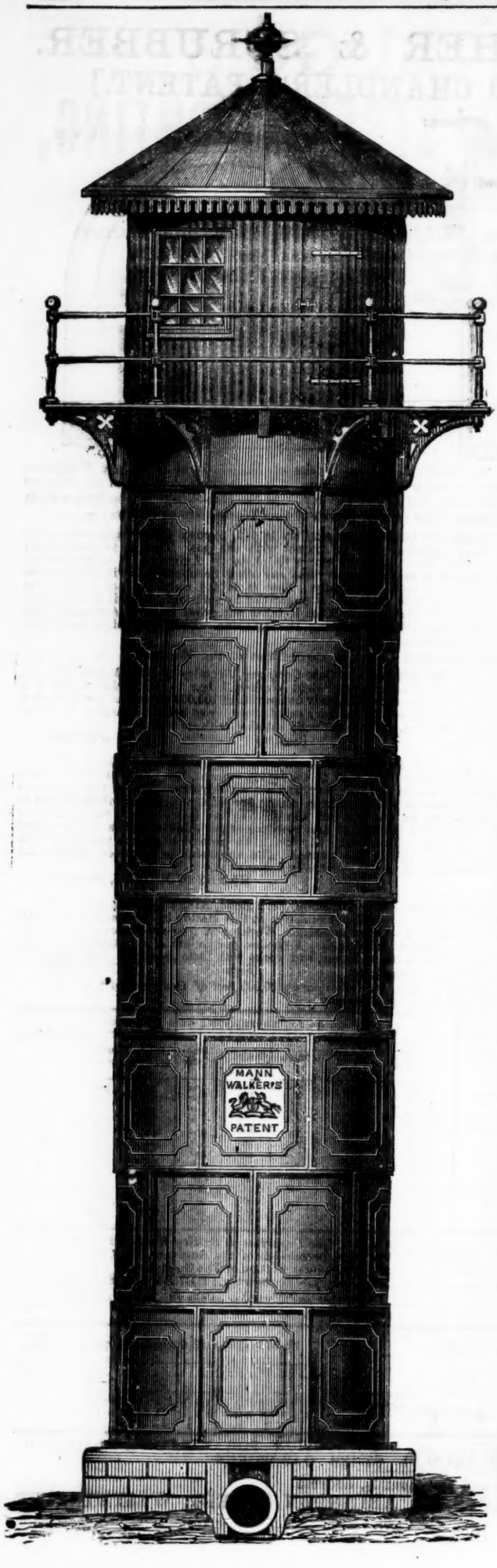
WASHER-SCRUBBERS OF THIS PATENT ARE IN COURSE OF CONSTRUCTION FOR BECKTON, BRADFORD, GREENWICH, WOOLWICH, AND SEVERAL OTHER GAS-WORKS.

For further particulars and testimonials, address

Messrs. KIRKHAM & HERSEY, GAS ENGINEERS, 21, ABINGDON STREET, WESTMINSTER.

C. & W. WALKER,
8, Finsbury Circus,
London, E.C.

MANN & WALKERS' PATENT SCRUBBER.



By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the im-portant results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

WILLIAM SUGG'S
IMPROVED SYSTEM OF STREET LIGHTING,

SUITABLE FOR EITHER COMMON OR CANNEL GAS.

Results obtained in Illuminating Power from WILLIAM SUGG'S 200-candle Burners with Cannel and Common Gas.

Burner used.	Variety of Gas.	Cubic feet of Gas burnt per hour.	Illuminating Power in Sperm Candles burning 120 grains per hour.	Number of Candles to which every cubic foot of Gas burnt is equivalent.
Sugg Burner	Common 16-candle ..	53·4	228	4·25
Do.	Cannel 19-candle ..	47·3	252	4·76

Joint experiment by—

CHARLES HEISCH, Superintending Gas Examiner to the Corporation of London.

T. N. KIRKHAM, M.I.C.E., F.C.S.

C. MEYMOTT TIDY, M.A., M.B., Professor of Chemistry and of Forensic Medicine at the London Hospital, Medical Officer of Health for Islington, and late Deputy Medical Officer of Health for the City of London.

The Illuminating power of the gas made by this Company, on the 9th inst., was 22·7 standard sperm candles for a consumption of 5 cubic feet per hour, in a Sugg's No. 7 steatite bat's-wing burner. On the same day the following results were obtained from two of Sugg's large new Argand Burners:—

FIRST EXPERIMENT.

Burner: Sugg's Argand, with two concentric flames.

Consumption per hour . . . . . 22·2 cubic feet.
Illuminating power . . . . . 103·7 candles.
or 4·67 candles per foot of gas.

SECOND EXPERIMENT.

Burner: Sugg's Argand, with three concentric flames.

Consumption per hour . . . . . 40·8 cubic feet.
Illuminating power . . . . . 208·8 candles.
or 5·12 candles per foot of gas.

I have reason to believe that these are as high, if not the highest results yet obtained per foot of gas from these burners.

(Signed) WILLIAM KING,
Liverpool United Gaslight Company,
Engineer's Office, Duke Street.

Liverpool, April 16, 1879.

[See JOURNAL OF GAS LIGHTING, April 22, 1879.]

"Sugg's 200-candle burner, with 42·09 cubic feet of 20·85-candle gas, gave an illuminating power of **231·56** candles."

"Same quality of gas as used at Westminster Bridge, and Waterloo Place, Regent Street."

(Signed) A. C. M'MINN,
Engineer to The Gaslight and Coke Company,
Kensal Green Station.

June 16, 1879.

SUGG'S ARGAND WITH THREE CONCENTRIC RINGS.

Illuminating Power of Gas.	Standard of Comparison.	Gas Consumed per Hour. Cubic Feet.	Illuminating Power.	Illuminating Power per Cubic Foot.
21 Candles	5-ft. London Burner.. {	45	220·5	4·9
		43	210·0	4·88

(Signed) J. R. FRITH,
Engineer, Runcorn Gas Company.

Glasgow Herald, April 25, 1879—

"The light exhibited last night" (Sugg's 200-candle Burner and Lantern) "was equal to **360 Candles**—more than double that given by the old lamps, while the consumption of gas was exactly the same,—**40 cubic feet per hour.**"

Major Dresser, Editor of the *American Gaslight Journal*, writes that—

"With **30** cubic feet of cannel gas I obtained **196·4** candles."

NOTICE.—Notwithstanding a number of statements which have been repeated in the public journals, that burners by other makers have surpassed these results, the reports of comparative experiments from which the above extracts have been copied conclusively prove that **the "Sugg" Burners give over 30 per cent. of Illuminating Power more than can be obtained from any other burners with the like quantity of gas.**

PRICES AND PARTICULARS ON APPLICATION TO

WILLIAM SUGG,
GAS ENGINEER,
VINCENT WORKS, WESTMINSTER, S.W.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

198, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

HARTHILL CANNEL

Yields 14,920 cubic feet of 40·92-candle gas per ton.

THRASHBUSH CANNEL

12,530 cubic feet of 40·22-candle gas per ton, and 9 cwts. of good coke.

LOTHIAN'S CANNEL

Yields 12,300 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash. This cannel is almost free from sulphur.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full analyses on application at above address, or from WEDDERSPOON, FERGUSSON AND CO., 21, Lime Street, LONDON, E.C.

GAS COAL.

THE MIRFIELD COAL COMPANY are supplying GAS COAL of the best quality on trucks at their siding. This Coal contains 10 per cent. of Cannel, and, as analyzed by Mr. James Paterson, of Warrington, yields 12,600 *cubic feet of* 16·67 *candle gas, with* 1430 *lbs. of good Coke, per ton.* Ash in Coke, 1·88.

Apply to the MIRFIELD COLLIERY, Mirfield, NORMANTON.
London Agents: SMITH BROS., 38, THROGMORTON ST., E.C.

HEBBURN MAIN GAS COAL.

This Coal is now highly approved of for gas making, and yields over 10,000 feet per ton of 15-candle gas, and about 14 cwt. coke.

For references and prices, either f. o. b. or by rail, apply to

W. RICHARDSON,

29, QUAYSIDE, NEWCASTLE-ON-TYNE.

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THE Tawd Vale Colliery Company, Limited, are prepared to Contract for the Supply of their superior Arley and other GAS COALS, and to send samples to the order of Gas Engineers and others, or complete analysis on application. Shipped at Liverpool, Preston, Fleetwood, Garston, or Birkenhead.

Mr. James Paterson, C.E., F.G.S., in his analysis of T. V. Arley Coal, says: "Some parts merge into a semi-Cannel; Gas per ton, 10,300 cubic feet; illuminating power, 16·96 candles; coke of high quality, 1431 lbs. per ton."

Collieries, Skelmersdale, near Ormskirk; Offices, 5, New Hall, Old Hall Street, LIVERPOOL.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

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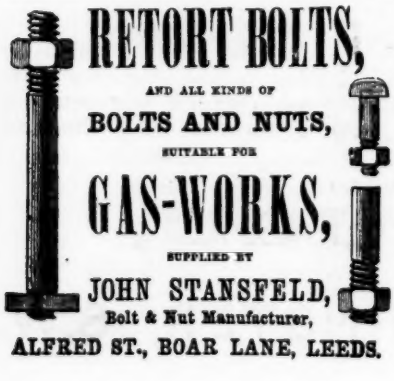
M. BREMOND'S NAPHTHALINE PROCESS.

All negotiations respecting M. Brémond's patented process for preventing Deposits of

NAPHTHALINE

in Gas Main and Service Pipes should be addressed to Mr. W. H. BENNETT, 22, Great George Street, WESTMINSTER, S.W., or to M. BREMOND, Gas Engineer, Compania Madrilena de Alumbrado y Calefaccion por Gas, MADRID, who may be consulted upon all matters connected with the Gas Industry.



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GAS *v.* ELECTRIC LIGHT.

WIGHAM'S PATENT GAS-BURNERS

FOR

STREET LIGHTING, &c., WHICH REQUIRE NO GLASS CHIMNEY.

Speaking of these burners, erected on the Thames Embankment by Westminster Bridge, the *Daily News* says:

"... A blaze of light is thrown out, which, in point of efficiency and brilliancy, far surpasses the large gas-lamps lately erected in Waterloo Place, *while even the electric lights are quite thrown into the shade.*"

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FUEL-MACHINE, for Compressing Breeze and Tar.

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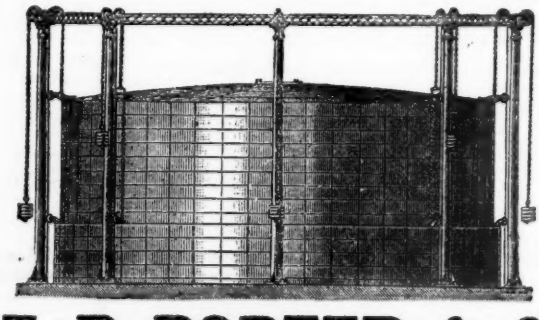

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ESTIMATES FOR GAS-WORKS OF ANY SIZE.

REFERENCES TO 500 WORKS ALREADY ERECTED.

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REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—
"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces 12,240 cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

GAS COAL. GAS COAL. GAS COAL.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise 2000 tons per day of REAL OLD SILKSTONE GAS COAL.
"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.
Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.
Full particulars will be sent on application to above address.

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GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

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MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS;

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For their Various Exhibits, amongst which is a

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RETORTS AND FIRE-BRICKS,

Being the Highest Honour given for this class.

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NEW PATENT WET GAS-METER,

THE "RELIANCE,"

MANUFACTURED BY THE

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The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

Accuracy is obtained by subjecting the whole of the water which determines the measuring chambers of the drum to one uniform even pressure, and so prevents unequal displacements of the water-line.

The "RELIANCE" METER has been tested by several of the most experienced official meter inspectors. Copies of their reports may be obtained on application to the

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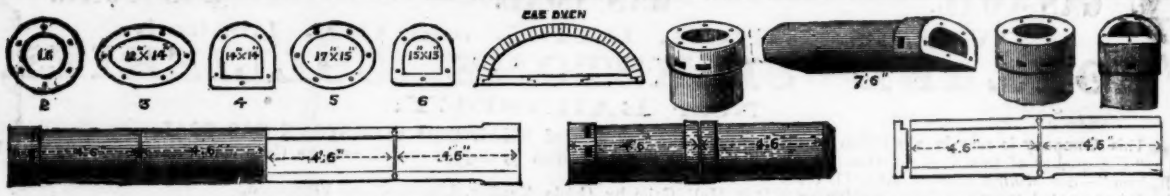
238, KINGSLAND ROAD, LONDON.



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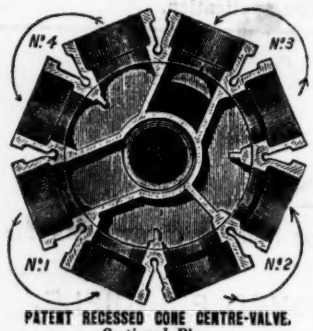

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Sectional Plan.

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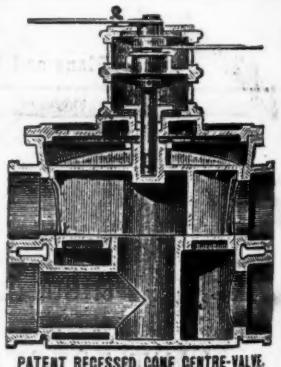
RECESSED CONE CENTRE-VALVES,

Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

Of all descriptions.



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Invite the attention of Gas Companies, Corporations, and others to their

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Which are so constructed that neither putty nor other materials are required to secure the glass. No hacking out of old putty, which frequently destroys the frames. A new pane of glass can be inserted in two or three minutes by any inexperienced person, the glass being secured by a hinged flap and turn button.

PRICE, with Opaline Reflecting Top, 12s.; with Fluted Glass Top, 10s. 6d.
Also made EXTRA STOUT recommended for its durability.

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By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

HULETT'S PATENT MERCURIAL REGULATOR,

For inserting in mains, to prevent the excess of pressure in high ground, or other elevated positions.

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